Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED FEB 10 1981
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SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC ~~THE~~ NEWLANDS RECLAMATION ~~PROJECT~~ (TRUCKEE-CARSON PROJECT) Thematic Resources

AND/OR COMMON The Truckee-Carson Irrigation District (TCID)

2 LOCATION

STREET & NUMBER The project area encompases a large area in west-central Nevada centered near Reno and a smaller area in north-eastern California within the Sierra Nevada range. (See enclosed map) __NOT FOR PUBLICATION

CITY, TOWN Fallon X VICINITY OF Reno

CONGRESSIONAL DISTRICT Nevada-at-large

STATE California/Nevada CODE 04/32 COUNTY CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	X AGRICULTURE	__MUSEUM
X BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	X YES: RESTRICTED	X GOVERNMENT	__SCIENTIFIC
X Thematic	__BEING CONSIDERED	__YES: UNRESTRICTED	X INDUSTRIAL	__TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME Water & Power Resources Service - Mid-Pacific Region

STREET & NUMBER Federal Building, 2800 Cottage Way

CITY, TOWN Sacramento __ VICINITY OF STATE California

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Churchill County Courthouse

STREET & NUMBER

CITY, TOWN Fallon STATE Nevada

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Nevada Historic Engineering Site Survey

DATE 3/25/79 __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS History of Engineering Program. Texas Tech University

CITY, TOWN Lubbock STATE Texas 79409

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	X ALTERED	__MOVED DATE______
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The theme of this nomination is Conservation. The Newlands Reclamation Project, began in 1903, was among the first projects to be started as a result of National legislation passed to reclaim the arid lands of the west for agricultural uses. All the components of the project were designed to conserve water and then divert it for beneficial uses. The production and distribution of electrical energy is a beneficial by-product.

The Truckee River flows from Lake Tahoe east to Pyramid Lake while the Carson River flows out of the Sierra Nevada mountains and empties into the Carson Sink. Water made available from natural flow and storage in Lake Tahoe and Boca Reservoir is diverted from the Truckee River into the 32.5 mile Truckee Canal at Derby Diversion Dam about twenty miles east of Reno. Land along the canal receives some of the water, but most is discharged directly into the Carson River through the penstock of the Lahontan Powerplant or through a chute into the Lahontan Reservoir for storage or use on the lands of the Carson Division. Water released from Lahontan Reservoir is diverted into the T and V canals at the Carson River Diversion Dam and two minor diversion dams downstream and flows to the largest area of the project lands in the vicinity of Fallon.

Other features of the project are 69 miles of main canals, 312 miles of laterals and 345 miles of open drains. Full irrigation service is provided to almost 1,000 farms, a total of 73,000 acres. There are three electrical substations in operation and sixteen miles of transmission lines which serve the communities of Fernley, Wadsworth and Hazen as well as rural sections of the project. At Lahontan Reservoir there are beaches, boating facilities, fishing and campgrounds.

The Lake Tahoe Dam is a concrete control structure 14 feet high with 17 outlet gates. It regulates the elevation of the water surface of the lake and controls releases of irrigation water and water for power generation. It is located at the outlet of Lake Tahoe into the Truckee River in California

Detailed specifications are as follows:

LAKE TAHOE DAM

Type: Concrete slab-and-buttress sluiceway regulator.

Construction period: 1909-1913

Dimensions (feet):
- Height 14
- Crest length 109
- Crest elevation 6233.2
- Volume (cubic yards) .... 400.

Outlet works: Seventeen 5'by4' gates
  Capacity (cubic feet per second)   3,000

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
_PREHISTORIC	_ARCHEOLOGY-PREHISTORIC	_COMMUNITY PLANNING	_LANDSCAPE ARCHITECTURE	_RELIGION
_1400-1499	_ARCHEOLOGY-HISTORIC	X CONSERVATION	_LAW	_SCIENCE
_1500-1599	X AGRICULTURE	_ECONOMICS	_LITERATURE	_SCULPTURE
_1600-1699	_ARCHITECTURE	_EDUCATION	_MILITARY	_SOCIAL/HUMANITARIAN
_1700-1799	_ART	X ENGINEERING	_MUSIC	_THEATER
_1800-1899	_COMMERCE	_EXPLORATION/SETTLEMENT	_PHILOSOPHY	_TRANSPORTATION
X 1900-	_COMMUNICATIONS	_INDUSTRY	_POLITICS/GOVERNMENT	_OTHER (SPECIFY)
		_INVENTION		

SPECIFIC DATES 1903,1911,1915 BUILDER/ARCHITECT U.S. Bureau of Reclamation

STATEMENT OF SIGNIFICANCE

The Newlands Reclamation Project is of national historical significance because it was one of the first five projects authorized by the Director of the Reclamation Service under the Newlands Reclamation Act of 1902.

The project design was the result of investigations begun by the United States Geological Survey in 1889. When the United States Reclamation Service was organized, shortly after the National Reclamation Act of 1902, the Truckee-Carson Project was among the first five projects selected for construction. The Secretary of the Interior authorized the project on March 14, 1903, and construction began the same year. Project features shown in the accompanying drawings, include outlet works at Lake Tahoe; Derby Diversion Dam (placed in the National Register of Historic Places in 1978), Lahontan Dam Reservoir and Powerplant; Carson River Diversion Dam; 104 miles of main canals; 504 miles of laterals; and 335 miles of open drains. Most of the features are located in ancient Lake Lahontan which was named for Baron La Hontan, an early western explorer.

Lahontan Power plant was finished November 11, 1911. Using the fall from the Truckee Canal to the Carson River, the plant supplied electric power for most of the construction of Lahontan Dam (begun in January 1911). Electric motors powered the main borrowpit shovel, a dragline excavator, a 925 foot belt conveyor to transport gravel and soil to the main embankment, the sand-cement batching plant, a 1,600 foot cableway for transporting concrete, and numerous pumps, blowers, drills and conveyors. According to the project manager, D. W. Cole, "probably the first electric shovel was employed on this work and handled the 500,000 cubic yards of gravel at a cost very much below what a steam shovel would have shown at the local prices for coal" (Engineering News, vol. 73, April 22, 1915, p. 760). The electrical machinery proved highly effective and dam construction was completed in June 1915.

The original scope of the Truckee-Carson Project included irrigation of over 400,000 acres. The Omnibus Adjustment Act of 1926 contained a provision that reduced the project scope considerably. In recent years about 70,000 acres have been under irrigation of which 60,000 to 65,000 acres are under irrigation at any one time.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Cole, D.W. "Lahontan Dam, Truckee-Carson Irrigation Project, Nevada." Engineering News, Vol. 16, No. 16 (April 22, 1915), pp. 758-62.

Hardman, George and Howard G. Mason. The Irrigated Lands of Nevada. The University of Nevada Agricultural Experiment Station Bulletin No. 183. Reno: University of Nevada 1949.

UTM NOT VERIFIED

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 228.59 Ac+ excluding canals ACREAGE NOT VERIFIED

UTM REFERENCES (see supplemental sheet attached)

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A				B			
C				D			

VERBAL BOUNDARY DESCRIPTION

(see supplemental sheets attached)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE		CODE		COUNTY		CODE	
STATE	Nevada	CODE	32	COUNTY	Churchill Lyon Storey, Washoe	CODE	001 019 029,031
STATE	California	CODE	04	COUNTY	Nevada Placer	CODE	057 061

11 FORM PREPARED BY

NAME / TITLE Wilbur E. Wieprecht, Historian, Nevada HP&A in cooperation with Wendell Bell, Research Assoc. & Donald Abbe, Research Assist.

ORGANIZATION History of Engineering Program — DATE May 1980

STREET & NUMBER Texas Tech University, P.O. Box 4089 — TELEPHONE (806) 742-3591

CITY OR TOWN Lubbock — STATE Texas

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE Mimi Rodden

TITLE Administrator SHPO — DATE 23 July 1980

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I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE 3/25/81

for DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: Patrick Andrus (accept all but those returned - see comment sheet) DATE 3/25/81

for/ KEEPER OF THE NATIONAL REGISTER

Boca Dam is located on the Little Truckee River within one mile above its junction with the Truckee River and approximately seven miles east of Truckee, California. It stores water primarily for the Truckee Storage Project around Reno and also for the Newlands Project.

Detailed specifications are as follows:

BOCA DAM

Type: Zoned earthfill

Construction period: 1937-1939

Dimensions (feet):
- Height 100
- Crest length .... 1,629.
- Crest elevation 5,612.0
- Volume (cubic yeards) 912,000.0

Spillway:
- Width (feet) 40
- Discharge capacity (cubic feet per second) 8,000

Outlet Works:
Concrete-lined tunnel in right abutment to two 4x4 slide gates in the gate chamber; thence two plate steel outlet pipes, controlled by two 42-inch needle valves.
Maximum discharge capacity (cubic feet per second) 900

The Derby Diversion Dam is located on the Truckee River 20 miles east of Reno. It is a concrete dam with an earthen embankment wing. This 31 foot high dam diverts river waters into the Truckee Canal.

As an entrant on the National Register, we recommend that it be made a part of this nomination.

LAHONTAN DAM is an earthen dam 120' high with an overall length of 5,400 feet. The main embankment, built in the bed of the Carson River, has a crest length of approximately 1,300 feet including an overflow spillway crest 250 feet in length at each end. The spillways step down with the terrain, curve and converge on a circular spillway pool 220 feet in diameter. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three-quarters of a mile (see attached Bureau of Reclamation drawings). The

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cross section of the dam has a top width of 20 feet and a maximum base width of 660 feet. The upstream slope is 3 to 1 while the downstream slope is 2 to 1 broken 12 feet above the spillway pool wall by a circular berm 10 feet in width. The 12-foot roadway at the top of the dam is carried across each spillway by means of five-span continuous reinforced concrete arches with 50-foot spans and 5-foot rises. A concrete railing guards the roadway and carries electric wire conduits for lighting the dam, gatehouse and roadway.

The outlet tower is a massive reinforced concrete structure in which are set 12 gates at two different elevations. Water from Lahontan Reservoir, which has an active capacity of 295,000 acre-feet, is let into the central chambers for discharge into the spillway pool via a 9-foot diameter conduit controlled by a hydraulically balanced cylindrical valve at the bottom of the tower. A 6-foot 6-inch diameter steel penstock, also controlled by a cylindrical valve, carries water to the power plant. A concrete penstock and separate outlet at the left or north side of the dam was abandoned in 1924. All of the gates in the tower are controlled by hydraulic oil pressure provided by an electrically operated pump. Access to the gatehouse is by means of a suspension footbridge extending from the top of the dam.

The powerhouse is a rectangular stone and concrete structure containing three generators with a combined capacity of 1,920 kilowatts. The fall from the Truckee Canal, which terminates at Lahontan Dam, was first utilized for hydro-electric generation at the powerhouse. This installation provided power for much of the dam construction (1911-1915). Since completion of the dam, the turbines driving the generators have been supplied by means of the steel penstock from the outlet tower in addition to the penstock from the Truckee Canal. The power plant continues to supply electric power to the surrounding area.

The Lahontan Dam and powerplant retains it original appearance, having undergone only minor modifications since its construction.

The <u>Carson River Diversion Dam</u> is a low concrete gate structure built in 1904 and 1905, to divert water into the canal system used to irrigate the farms in the Newlands Projects. Located on the Carson River five miles northeast of Lahontan Dam, this diversion dam performs a vital water distribution function for hundreds of farms in the Newlands Project.

Detailed specifications are as follows:

CARSON RIVER DIVERSION DAM

Type: Concrete gate structure

Construction period: 1904-1905

Dimensions (feet):
Height 21
Crest length 241
Crest elevation 4044.75
Volume (cubic yards) 2,700

Spillway: Twenty-one 5 by 10 foot double leaf slide gates and one 15 by 10 foot gate.
Capacity (cubic feet per second) ... 30,000

Headworks: Three double leaf rising weir gates, each 5 by 15 feet, for V Canal heading (commonly used as underflow gates). Two wood slide gates 7 by 5 feet for T Canal heading.
V Canal capacity (c.u. ft. per second) 1,500
T Canal " " " " 450
See attached Bureau of Reclamation drawings.

Carriage Facilities

These principal canals carry waters from the Truckee and Carson Rivers to the storage, power, and diversion works described previously. A description of these facilities will round out an account of the main engineering works in the Newlands Project. Beyond the works described, there are many lesser dams, storage facilities, canals, drains, auxiliary power plants, and feeder systems to the agricultural land being utilized.

The Truckee Canal serves to carry waters from the Truckee River, diverted at Derby Dam, for thirty one miles to the Lahontan Dam.

Detailed specifications are as follows:

TRUCKEE CANAL

Type: Both concrete and earth lined.

Construction period: 1903-1906
Length (miles) 31
Diversion capacity (cubic feet per second) 1,500

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Typical maximum section in earth:

Bottom width (feet)	20.0
Side slopes	1 1/2:1
Water depth (feet)	13.0

Typical maximum section, concrete-lined:

Bottom width (feet)	20.4
Side slopes	1/2:1
Water depth (feet)	13.0
Usual maximum flow (cubic feet per second)	1,000

The V Canal carries waters from both the Truckee and Carson Rivers east from the Carson River Diversion Dam south of the Carson River to the vicinity of Fallon, Nevada.

Detailed specifications are as follows:

V CANAL

Type: Earth

Construction period: 1904-1905

Length (miles)	26
Diversion capacity (cu. ft. per second) ..	1,500

Typical maximum section in earth:

Bottom width (feet)	22
Side slopes	2:1
Water depth (feet)	12
Usual maximum flow (cu. ft. per second) ..	

The T Canal carries waters east from the Carson River Diversion Dam north of the Carson River to the vicinity of Fallon.

Detailed specifications are as follows:

T CANAL

Type: Earth

Construction period: 1904-1905

Length (miles)	9
Diversion (cu. ft. per second)	450

Typical maximum section in earth:

Bottom width (feet)	10

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T Canal (continued

Side slopes	2:1
Water depth (feet)	6
Usual maximum flow (cu. ft. per second)	

The "V" Canal Powerplant is a rectangular poured concrete structure, an approximate size 40'x60' feet. It is located at a 26 foot drop in the canal, six miles west of Fallon, Nevada. The unit was built by the Truckee-Carson Irrigation District and is operated by the Sierra Pacific Power Company of Reno. Output is fed into the power company's system.

Detailed specifications are as follows:

"V" CANAL POWERPLANT (constructed by TCID)

Year of initial operation: 1955

Year last generator placed into operations: 1955

Name plate capacity (kilowatts):

Existing	800
Ultimate	1,600

Number and name plate capacity of generators

(kilowatts):	800

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The Truckee-Carson Project was renamed in 1919 in honor of the late Nevada Senator Francis G. Newlands who was instrumental in promoting the passage of the National Reclamation Act of 1902. The operating agency which assumed control in 1926 is named the Truckee-Carson Irrigation District. Several disputes over water appropriations have arisen, but the technical feasibility of most of this significant project is unquestioned.

In a state with extremely limited agricultural resources, the Newlands Project has assured the production of crops and livestock on what was once desert. Besides assuring pasture lands, crops raised include alfalfa, barley, wheat, vegetables and small fruits. It is significant to Nevada for its conversion of waste lands to productive lands.

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CONTINUATION SHEET Bibliography ITEM NUMBER 9 PAGE 2

Headly, F.B. and Cruz Venstrom. Economic History of the Newlands Project. The University of Nevada Agricultural Experiment Station Bulletin Np. 120. Reno: University of Nevada, 1930.

Little, H.Clay. The Truckee's Agricultural Value. College of Agriculture Bulletin No. 3. Reno: University of Nevada, 1965.

Miller, Meredith R., George Hardman and Howard G. Mason. Irrigation Waters of Nevada. The University of Nevada Agricultural Experiment Station Bulletin No. 187. Reno: University of Nevada, 1953.

Townley, John M. Turn This Water Into Gold. Reno: Nevada Historical Society, 1977.

U.S. Bureau of Reclamation. Reclamation Project Data. Washington: Government Printing Office, 1961.

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UTM References:

Lake Tahoe Dam - 10/746760/4339000

Boca Dam - 10/750340/4363940

Derby Diversion Dam - 11/189850/4384700

Lahontan Dam & Powerplant - A. 11/321950/4370000
B. 11/322750/4370250
C. 11/322400/4369500

Carson River Diversion Dam - 11/328100/4373650

V-Canal Powerplant - 11/336450/4372150

Verbal Boundary Descriptions

Lake Tahoe Dam - The proposed boundary includes the area within a 55' radius from the center of the dam. 0.10 acres

Boca Dam - The proposed boundary includes that area within a 1055' radius from the center of the dam. 80.04 acres

Derby Diversion Dam (on National Register) - The proposed boundary includes that area with a 150' radius from the intersection of the two concrete structures that form the dam proper. 0.52 acres

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CONTINUATION SHEET Geographical ITEM NUMBER 10 PAGE 3

Lahontan Dam and Powerplant - The nominated property includes the dam and powerplant structures within the area delineated on the accompanying map beginning at Point A 1,000 feet west-southwest of the intersection of the service road and road across the dam to Point B 300 feet northwest of the powerhouse to Point C 350 feet southwest of the intersection of the service road at the other end of the dam. 68.87 acres

Carson River Diversion Dam - The proposed boundary of the nominated property includes the area within a 130 foot radius from the center of the dam. 1.35 acres

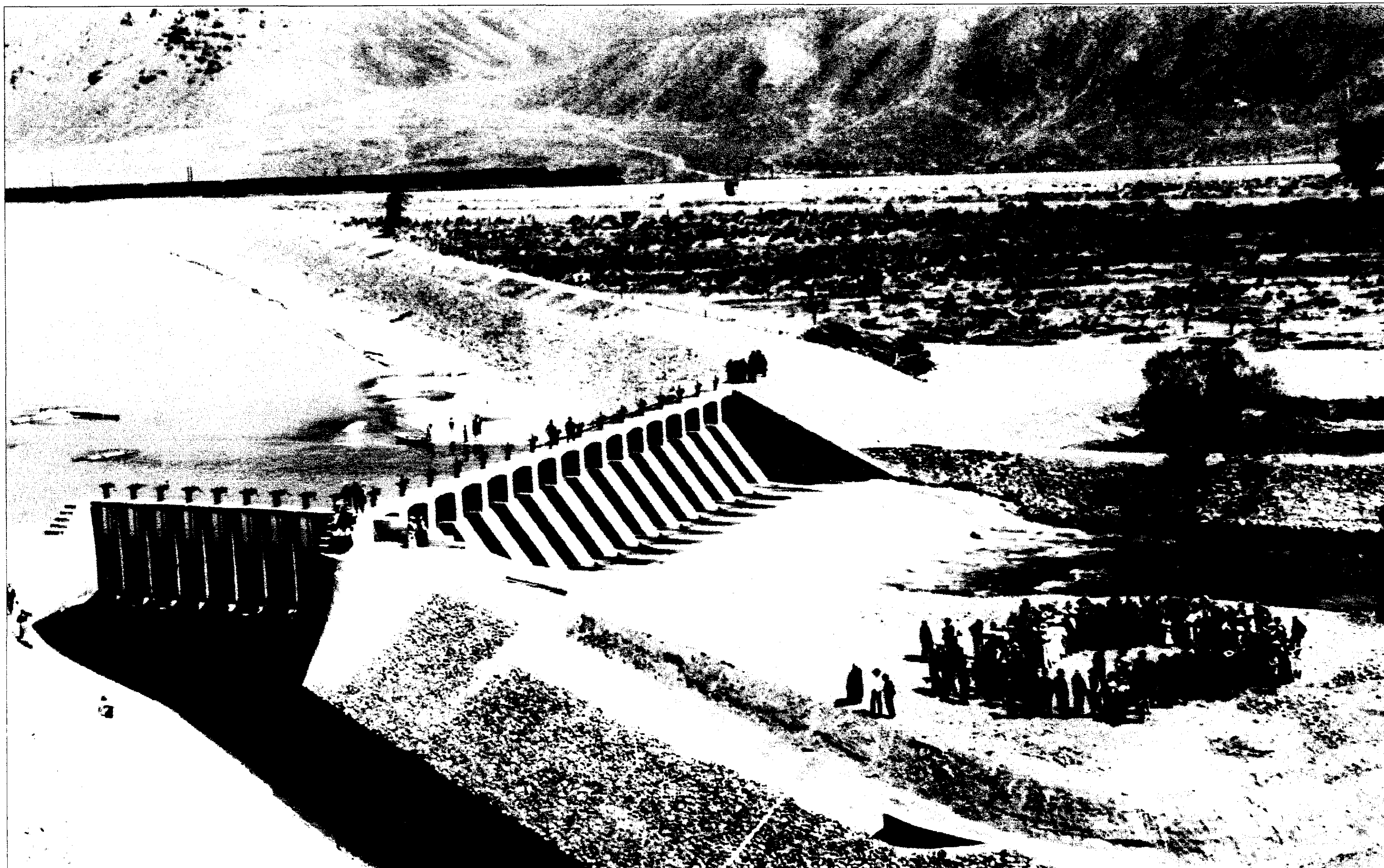
V-Canal Powerplant - The proposed boundary of the nominated property extends 30' from all sides of the powerplant. 0.31 acre

EVALUATING THE NATIONAL REGISTER ELIGIBILITY OF CULTURAL RESOURCES IN THE NEWLANDS PROJECT, NEVADA

Donald L. Hardesty and Larry Buhr
University of Nevada, Reno

Report Prepared for the United States Department of Interior, Bureau of Reclamation, Mid-Pacific Region, Sacramento, California. In Partial Fulfillment of Agreement 98-FC-20-17430

July 23, 2001



Congressional party and spectators gather at base of right abutment during the dedication of Derby Dam on June 17, 1905.

INTRODUCTION

This report intends to clarify elements of the Newlands Project that do and do not contribute to the Newlands Project National Register District (District). The need for clarification arises from the ambiguity of the original 1978 National Register nomination that has made management of the district difficult. Whatever its other historical values, the Newlands Project District first and foremost marks the importance of the federal government in promoting settlement of the American West through the development of irrigation agriculture. The Newlands Project is one of the earliest large-scale engineering schemes designed to achieve this federal goal. This report, therefore, focuses upon key components of the irrigation system (e.g., dams, canals, drains, and laterals) constructed by the federal government that are essential to the water storage and delivery system. For this purpose, the direct involvement of the federal government ends in 1926, when it transferred the operation and maintenance of the Newlands Project to the Truckee-Carson Irrigation District (TCID). The report considers only those components of the Newlands Project that either are owned by the Bureau of Reclamation (Reclamation) or for which Reclamation holds a right-of-way. It does not include components of the irrigation system such as privately owned farms and associated structures (e.g., ditches and laterals) that fall outside of Reclamation's legal authority. The report also does not consider historic landscapes in the District for much the same reason. Certainly irrigation transformed the area of the Newlands Project into a historic agricultural landscape; however, the key landscape elements are privately owned farms that fall outside the Bureau's legal jurisdiction. Finally, the report excludes from consideration the 1807 structures constructed by the Civilian Conservation Corps (CCC) between 1935 and 1942 (Pfaff 1999). The CCC involvement in the Newlands Project intended to put people to work during an economic depression rather than to develop irrigation farming in the region. For this reason, the CCC structures, while significant in their own right, are considered to fall outside the theme of the Newlands Project National Register District.

even though not going to nominate, document them in the historic context — property type?

DESCRIPTION

extend context to include CCC to 1942 close of the camp

In 1902, the United States Congress passed the Reclamation Act to bring arid lands of the American West into agricultural production. Construction of the Newlands Project (originally known as the Truckee-Carson Project) began in 1903 as one of the first five projects of the United States Reclamation Service (Reclamation Service) authorized under the Act.

Most of the Newlands Project encompasses the lower drainage basins of the Carson River, which flows east out of the Carson Range of the Sierra Nevada Mountains and empties into the Carson Sink, and the Truckee River, which flows from Lake Tahoe east to Pyramid Lake, in western Nevada. The project consists of a network of water control structures and associated properties that not only stores and distributes water for irrigating almost 73,000 acres of farmland but also generates hydroelectric power and controls flooding. Project features include water storage and diversion structures, water conveyance structures, power plants, and pumping stations.

On the Truckee River, Lake Tahoe Dam impounds and regulates upstream water flow. Further downstream near Fernley, Nevada, Derby Dam diverts water from the Truckee River into the Truckee Canal, which carries it 32 miles to Lahontan Reservoir on the Carson River and also

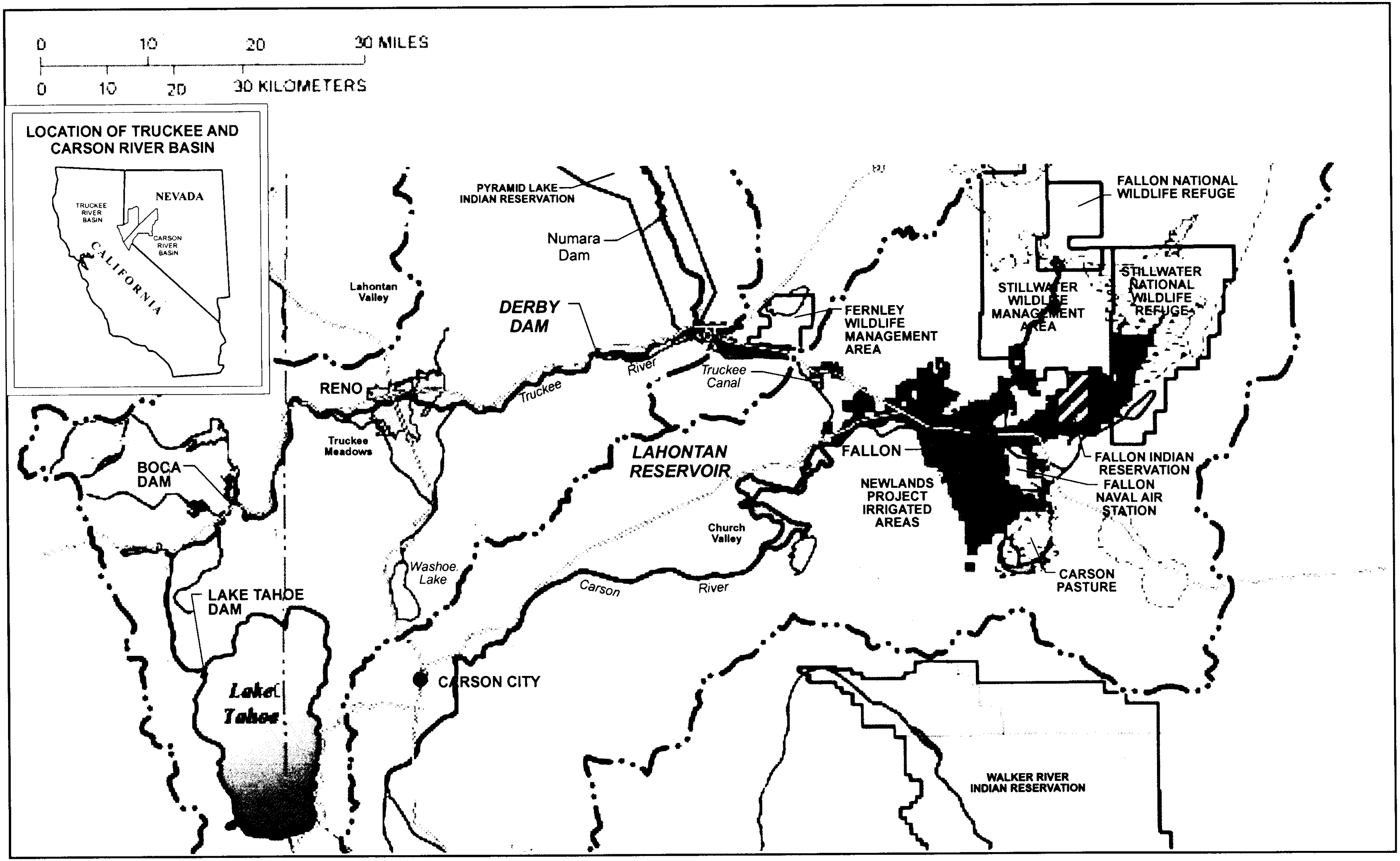


Figure 1. Regional location of the Newlands Project and adjacent areas. Map based on U.S. geological Survey digital data, 1:100,000.

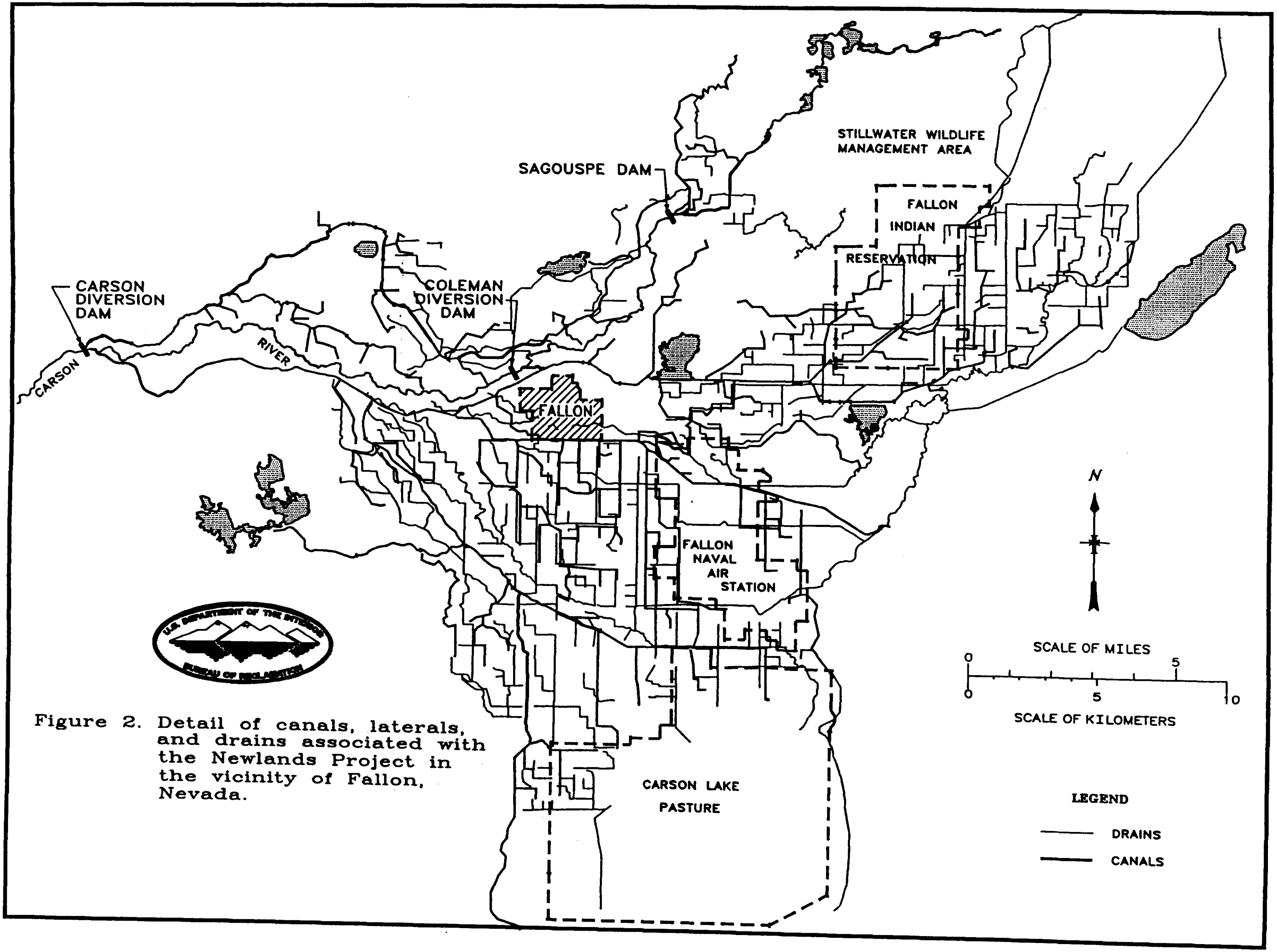


Figure 2. Detail of canals, laterals, and drains associated with the Newlands Project in the vicinity of Fallon, Nevada.

irrigates farmland in the vicinity of Fernley. On the Carson River, the Carson Dam diverts water from the Carson River into the south distributing "V" canal and into the north distributing "T" canal, both of which transport water to farmlands in the Lahontan Valley around Fallon, Nevada. Lahontan Dam impounds and regulates water flow on the Carson River just above Carson Dam. The Newlands Project also includes a network of drains that carry excess irrigation water away from the farmlands into drainage sumps such as Carson Lake Pasture.

Condition

The Reclamation Service built the core structures of the Newlands Project between 1903 and 1915. Much of the drainage system, however, was constructed between 1921 and 1928. Other minor structures such as small dams, drains, lateral canals, small power plants, and small reservoirs were added later, and continue to be added, to the project. The condition of the Newlands Project today reflects its history as an ongoing dynamic system with many components that have been replaced, remodeled, or repaired over the years. For this reason, most canals no longer have original linings, dams no longer have original gates or needle valves, and power plants no longer have original turbines. The late twentieth century saw the setting of the Newlands Project area change from rural farming to urbanism and a military training facility. At the same time, the original configuration, workmanship, materials, use, and character of the Newlands Project have not changed significantly and still very much convey their historic associations and period of significance. The Project also retains integrity of location and the general character of its original setting, along with feeling and association.

reg. requirements
→ integrity in ↓

Existing Legal Status

The National Register currently lists nine historic structures associated with the Newlands Project. They include Derby Diversion Dam (Truckee River Diversion Dam), listed in 1978 as a separate structure, and four other structures listed in 1981 as thematic resources of the Newlands Reclamation (Truckee-Carson) Project: Boca Dam, Lake Tahoe Dam, Carson River Diversion Dam, and Lahontan Dam and Power Station. Boca Dam, however, was constructed between 1937 and 1939 as part of the Truckee Water Storage Project and, therefore, is not part of the Newlands Project. The nomination also identified several other structures as thematic resources. They include the Truckee Canal, the T-Canal, the V-Canal, and the V-Canal Power plant (see Federal Register February 24, 1981). The National Register listed none of the "other features" in the nomination (e.g., smaller canals, laterals, and drains) for lack of necessary information.

HISTORIC CONTEXT

→ what are the other 5 - compare Newlands to these

The historical importance of the Newlands Project lies in its association with the first federal effort to develop arid lands in the American West for agricultural purposes. It is one of the first five federal reclamation projects authorized by the Director of the Reclamation Service under the Reclamation Act of 1902 (Townley 1998: 22). The Reclamation Act authorized the U.S. Department of the Interior to reserve public lands for farmers in the arid West and to construct water storage and conveyance facilities for using and conserving water under the direction of the Secretary of the Interior (Rowley 1996: xi). Economic development of the American West in the twentieth century depended upon the provisions of the act. The Reclamation Service implemented the provisions of the act by working to create new irrigated farmlands in the desert West that could be homesteaded. The Newlands Project encouraged farmers to homestead irrigated lands in the Lahontan Valley. From an engineering perspective, the Newlands Project is not dramatic or extraordinary. Certainly it pales in comparison to later reclamation projects in the American West such as the Hoover Dam or the Colorado Big-Thompson Project. Most of the water conveyance structures in the project, for example, are simple ditches, and the water diversion and storage structures have a very basic water engineering design.

Background

The Newlands Project is strongly associated with in the expansion of the United States into the arid lands of the American West. Archaeological evidence suggests that Native Americans lived in the area of the Carson River and Truckee River drainages for at least 11,000 years (Elston 1986). European American forays into the region began with the explorations of Peter Skene Ogden of the Hudson Bay Company in 1828. The Bidwell-Bartleson Party opened the California Trail through the region in 1841. In 1859, the discovery of the Comstock Lode first attracted large numbers of emigrants to the region and brought about Nevada's earliest urban settlement at Virginia City. Completion of the Central Pacific Railroad through the region in 1868 encouraged even more settlement. Precious metals mining dominated the economy of the region and the state of Nevada in the 1860s and 1870s. Ranching and farming both emerged in the two river basins to support the growing population. Falling silver prices, however, brought a major depression in the mining industry by the 1880s, however, and with it the search for recovery. Cattle ranching helped for a while, but unpredictable market prices, high railroad transportation costs, and several severe winters forced many ranchers into bankruptcy. William M. "Big Bill" Stewart and other Nevada politicians took up the causes of remonetizaton of silver and irrigation as ways to put the state's economy back on firm footing (Rowley 1995: 113).

Silver Party politics didn't go very far, but the cause of irrigation as a way to develop an agricultural economy in Nevada set the stage for the Newlands Project. John Wesley Powell and several western senators, most notably Nevada senator William M. Stewart, led the drive to develop the arid western lands for agricultural purposes. The drive was a late nineteenth century extension of the national movement to expand Westward. As early as 1862, the Homestead Act of 1862 not only encouraged settlement in the American West but also reflected a national "back-to-the-land" movement to restore rural values to American life (Rowley 1991). More homesteading legislation in the first two decades of the twentieth century brought a renewed effort to settle public lands in the American West. The legislation includes the Reclamation Act of 1902, the Forest Homestead Act of 1906, the Enlarged

Homestead Act of 1909, and the Cattleman's Homestead Act of 1916) (Rowley 1991). The Reclamation Act withdrew 2.6 million acres of land from public domain and opened it to homesteading, including thousands of acres of Newlands Project land.

The Beginnings of the Newlands Project

On October 2, 1888, congress appropriated $100,000 for the U. S. Geological Survey to assess the reclamation possibilities of the arid western states. One of the USGS survey teams arrived in the Lahontan Valley about a month later and spent the next several months mapping the potential sites of several structures, including Derby Dam and the Truckee Canal. The project, however, remained on hold for another decade in the aftermath of Powell and Stewart's bitter fight over whether the reclamation lands and projects should be under federal or state control. In 1902, the project gained new life with the passage of the Reclamation Act under the guidance of Nevada congressman, soon to be Senator, Francis G. Newlands and with the strong support of President Theodore Roosevelt. President Roosevelt organized the Reclamation Service the same year to administer new federal reclamation projects with the goal of opening up the American West to new agricultural settlement.

Work started on the first reclamation projects the following year (1903), one of which, and the earliest in Nevada, was the Truckee-Carson Project, renamed the Newlands Project in 1919 in honor of Senator Newlands. The original plan for the project called for 450,000 acres of irrigated land with waterworks extending from Lake Tahoe into the Carson and Truckee River basins and beyond to Lovelock and the Humboldt Sink (Townley 1998: 22, 36). Several reservoirs, diversion dams, and canals formed the core of the planned waterworks. The diversion dams and canals would be constructed first, followed later by storage facilities of at least five reservoirs on each of the two rivers (Simonds 1996: 8). By 1926, however, the Reclamation Service found that the waterworks could irrigate only about 87,500 acres (Townley 1998: 48).

Construction and Engineering History

The Secretary of the Interior authorized work on the Truckee-Carson (Newlands) Project in March, 1903. Almost immediately, the Reclamation Service opened an office in Reno and placed Leon H. Taylor, formerly a USGS hydrographer who played an important role in selecting the Truckee-Carson site, in charge of the project (Simonds 1996: 8). Construction first began on the Derby Diversion Dam and the Truckee Canal. The plan called for Derby Dam to divert water from the Truckee River into the Truckee Canal, which then would carry the water 32 miles to the Carson River. For purposes of construction, the Reclamation Service divided the Truckee Canal project into three divisions and solicited separate bids for the construction of each division. Division 1 included Derby Dam, the headworks of the Truckee Canal, and the first six miles of the canal; Divisions 2 and 3 covered the remainder of the canal (Simonds 1996: 8). The Reclamation Service opened the first bids for the project on July 15, 1903 (Simonds 1996: 8). (Note, however, that Townley 1998: 24 gives the date as June 13, 1903.) Work began soon afterwards. The contractors, advertising widely in cities throughout the American West, hired more than 500 men to work on the dam and another 1,000 workers to dig the 32 mile canal.

Because of the remoteness of the project location, construction workers had to live in temporary camps set up nearby. The first workers lived at Derby camp on the Truckee River, which soon acquired a reputation as a "hell hole" of violence, crime, gambling, and prostitution. In 1904, the Reclamation Service moved their Reno office to Hazen on the Southern Pacific Railroad and the closest railhead to the ongoing construction of the Truckee Canal and canals in the Lahontan Valley (Townley 1998: 26). Growing rapidly, Hazen soon enjoyed the same reputation as Derby camp. Other work camps are associated with the Truckee Canal. The Reclamation Service organized the construction of the Truckee Canal into three 10 mile divisions and contracted separately for each division, resulting in three work camps spaced about 10 miles apart (Townley 1998: 25). Completion of Derby Dam and the Truckee Canal brought about the abandonment of all these work camps except for Hazen, which also played an important role in the construction of Lahontan Dam between 1911 and 1915. The Lahontan Dam construction camps of Lahontan City and Bohunkville grew up during this time period. Lahontan City grew up on high ground north of the site of the dam. English-speaking workers, supervisors, and some families lived at the settlement, which had a cookhouse, billiard hall, barber shop, library, and its own marching band (Townley 1998: 30). Slavic workers from eastern Europe lived at Bohunkville next to the dam site along the Carson River. After the completion of Lahontan Dam in 1915, Lahontan City and Bohunkville were abandoned and Hazen rapidly declined.

In addition to the laborers, the contractors used three large Fresno drag-line excavating machines powered by horses and mules to dig the Truckee Canal (Simonds 1996: 9; Townley 1998: 25). Four tunnels also had to be excavated for the canal. Senator Newlands dedicated the Derby Diversion Dam and opened the headgates of the Truckee Canal on June 17, 1905, two years after the construction project began.

On September 9, 1904, the Reclamation Service awarded the first contract for the construction of the Carson River Diversion Dam and the water conveyance structures that would carry the water to farmers takeout ditches in Lahontan Valley (Simonds 1996: 10). The water conveyance structures included two main canals to carry water from the Carson River Dam to the vicinity of the farms. One was the nine mile long northside canal (T Canal) on the north side of the river; the other was the 27 mile long southside canal (V Canal) on the south side of the river. They also included the first phase of what eventually developed into a massive network of 300 miles of lateral canals and almost 350 miles of drains. Work on the Carson River end of the project came to a close on July 21, 1905. The first water reached project farms in February of 1906.

After this first construction phase, the Newlands Project added a few secondary diversion dams and main canals. These include the Coleman Diversion Dam and the Sagouspe Dam, both on the Carson River below the Carson River Diversion Dam and constructed in the years between 1935 and 1945. In addition, they constructed lateral canals for several more years. The Civilian Conservation Corps (CCC), one of the New Deal federal government relief programs, played an

did CCC work on any of the first 5 reclamation projects important role in this later construction. They established Camp Fallon at the west edge of Fallon, Nevada, in 1935 to house CCC enrollees assigned to the Newlands Project (Townley 1998: 68). Camp Carson River followed soon thereafter, later replaced by Camp Newlands in downtown Fallon. In the next few years, the CCC worked on Sheckler Reservoir, renovated the Truckee Canal, rebuilt diversion gates, installed bridges and culverts, cleaned canals and laterals, and dug new drains (Townley 1998: 68). The last CCC camp closed in 1942.

The second planned phase of the Truckee-Carson Project constructed storage facilities. Toward this end, the Reclamation Service contracted for the construction of the Lake Tahoe Dam in 1905; however, the work came to an immediate stop because of an injunction filed by power companies with existing water claims, a continuation of previous legal actions (Simonds 1996: 11). Irrigation water shortages starting as early as 1908 and the inability to build the Lake Tahoe Dam soon led to a decision to construct a storage dam and reservoir on the Carson River. In 1910, the Secretary of the Interior authorized the facility, Lahontan Dam, to be built close to where the Truckee Canal emptied into the Carson River. Construction on Lahontan Dam started in February of 1911. The Reclamation Service first built a hydroelectric power plant at the site to supply power for the construction project. After its completion in early November of 1911, the power plant generated 1,000 kilowatts of power by diverting water from the Truckee Canal into a 500 foot long steel penstock to drive two turbine-powered General Electric 500 kilowatt generators (Simonds 1996: 13). The power plant supplied electricity to run much of the construction machinery used on the project. D.W. Cole, the project manager, stated that

> Probably the first electric shovel was employed on this work and handled the 500,000 cubic yards of gravel at a cost very much below what a steam shovel would have shown at the local prices for coal. (Engineering News, volume 73, April 22, 1915, page 760)

In addition, the power plant ran electric motors on a dragline excavator, a 925 foot long belt conveyor to transport gravel and soil to the main embankment, the sand-cement batching plant, a 1,600 foot long cableway for transporting concrete, and numerous pumps, blowers, drills, and conveyors.

The Reclamation Service finally completed the Lake Tahoe Dam in 1913 during the construction of Lahontan Dam after the agency and the power company reached an agreement. Lake Tahoe Dam is an 18-feet high and 109-feet long concrete slab and buttress structure that controls the top six feet of Lake Tahoe with a series of 17 gates. The completion of both dams brought to a close the construction of primary water storage facilities on the Newlands Project. Continuing drought years in the 1920s and 1930s, however, led to intense political pressure to construct more storage facilities (Townley 1998: 49). The initial Newlands Project plan called for the construction of a reservoir in Spanish Springs Valley, and the Reclamation Service decided to build such a facility by 1920. They abandoned the idea by 1926, however, upon encountering intense opposition from downstream water users in the Lahontan Valley because of the threat of higher water costs. The search for more upstream storage continued. In 1939, the completion of Boca Dam on the Little Truckee River added more upstream water storage capacity that is available under some circumstances to water users in the Newlands Project, although the dam is not considered to be part of the Project. Several downstream secondary reservoirs also came into line beginning in 1935 with the work of the CCC, which built the S-line regulating reservoir and Sheckler Reservoir between 1935 and 1942. Stillwater Point Reservoir was constructed between 1942 and 1945 and, still later, Harmon Reservoir and Old River Reservoir.

Drainage problems created another engineering challenge for the Truckee-Carson Project. The original engineering plan called for large open trenches spaced ½ mile apart to adequately drain the fields, but cost cutting decisions greatly reduced the size and number of drains. Early drains included a tile system that failed. As early as 1909, rising water tables and salinization in newly irrigated agricultural fields threatened the failure of the project. The Reclamation Service responded by insisting that the farmers were responsible for draining their own fields. They, however, agreed in 1916 to begin work on a better drainage system as soon as a water users association could be organized that could contract for the excavation of new drains. The state of Nevada legislature approved formation of a new irrigation district in March, 1917, and the Truckee-Carson Irrigation District formally came into existence on November 16, 1918. Some drains were constructed in Fernley in the same year. The name of the Truckee-Carson Project officially changed to the Newlands Project in March of 1919, two years after the death of Senator Newlands. In 1921, work began on the first phase of the drainage project, which ended in 1924. Construction crews excavated over 150 miles of deep open drains that were 10 feet deep and nine feet wide at the bottom. Late in 1926, the Secretary of the Interior officially contracted with the Truckee-Carson Irrigation District (TCID) to operate and maintain the Newlands Project. The Bureau of Reclamation turned over all maps, files, records, and documents of the project to the TCID. The second phase of the drainage project began in 1926 and ended in 1928, completing another 81 miles of drains. Soon afterwards, the water table in the irrigated fields dropped dramatically, causing one Reclamation Service engineer to write that "a real transformation has taken place on the Newlands Project which, in 1921, was practically an alkali bog" (Townley 1998: 47). Drains, however, continued to be built after 1928 to relieve sporadic drainage problems.

The Newlands Project and Regional Economic Development

The Newlands Project clearly played the key role in the twentieth century economic development of the region. Most of the project water supported agriculture, irrigating about 6,200 acres in the Fernley area and another 66,700 acres in the Lahontan Valley (Simonds 1996: 38). Today, however, the irrigated acreage is being reduced by changes in cropping patterns, agricultural practices, urban development, and the acquisition of water rights by the U.S. Fish and Wildlife Service. The pattern of development of the region reflects not only engineering problems with the project such as inadequate water and drainage but also larger economic patterns such as the Great Depression. Irrigated farming using water from the Carson River first developed significantly in the region in the 1870s and increased to about 5,000 acres by the end of the decade (Townley 1998: 9). The farms produced mostly hay and grain to be sold in the mining towns of the region. More irrigation and the growth of the beef cattle industry in the region in the

1880s and 1890s brought demands for water storage and public reclamation that ultimately helped create the Truckee-Carson Project (Townley 1998: 9). The project initially planned to irrigate 400,000 acres in the region. Toward this end, the Reclamation Service opened up 800 parcels of land for settlement in the project in 1904 (Simonds 1996: 36). Farms occupied only 300 of these by 1908, and lack of water forced closure of the project to new settlement in 1910 (Simonds 1996: 36). The project reopened in late 1914 after the completion of Lahontan Dam. Veterans attracted to the project after World War I brought the number of farms up to 906 by 1922 (Simonds 1996: 37). The number of project farms dropped during the Depression Era but rose to 729 by 1940 and continued to grow thereafter, increasing to 990 by 1965 and to 1,200 in 1980 (Simonds 1996: 37). Alfalfa production supported many of the project farms from the beginning and continues to be the mainstay of the region. The farmers also experimented, however, with a variety of other crops, especially sugar beets in the 1900s and 1910s, melons in the 1910s and 1920s, eggs and poultry in the 1920s and 1930s, dairy cattle, and orchards (Townley 1998: 57-66; Simonds 1996: 38).

The Newlands Project and Water Litigation

The Newlands Project since its inception found itself often embroiled in water litigation. Many of the issues focused on Lake Tahoe (Simonds 1996: 11-12). The initial plan for the project assumed that the water in the lake would be available to meet most of the irrigation needs downstream. To do this, however, the Reclamation Service had to gain control of the water. They attempted to acquire a small dam at the outlet of Lake Tahoe operated by the Donner Boom and Logging Company in 1902. The company, however, sold the dam to the Truckee River General Electric Company instead. In July of 1904, the Reclamation Service acquired land just below the dam and began construction on a new dam in 1905. The downstream power companies filed an injunction to stop the project. Not until 1913 did the Reclamation Service and the power companies reach an agreement that allowed completion of the new Lake Tahoe dam (Simonds 1996: 17). On July 1, 1915, the United States finally received control over water in Lake Tahoe with issuance of the "Truckee River General Electric Decree," which gave the Reclamation Service an easement to operate the Lake Tahoe Dam and surrounding area and which guaranteed minimum year-round flow rates in the Truckee River for hydroelectric operations downstream (Simonds 1996: 18).

Another stage for water litigation was the Truckee River itself. The Reclamation Service began legal proceedings in 1913 to adjudicate the rights of water users on the Truckee River upstream from Derby Dam (Simonds 1996: 18). Not until the issuance of the Orr Ditch Decree in 1944 did litigation finally end.

The issuance of the Talbot Decree in 1926 allocated the Truckee River water among its users and appointed a Federal Water Master for the river (Simonds 1996: 22). In the meantime, several other legal events went into play. The 1935 Truckee River Agreement established the natural rim of Lake Tahoe, allowed for storage of just over six feet of water in the lake, incorporated minimum flow rates, and contained language for settling disputes over pumping of Lake Tahoe water during periods of low water (Simonds 1996: 24). The 1944 Orr Ditch Decree established individual water rights on the Truckee River within the framework of the Truckee River Agreement and granted the two most senior rights to the Pyramid Lake Paiute Indian Tribe (Simonds 1996: 24).

Pyramid Lake, although not part of the Newlands Project, emerged as another key stage for water litigation associated with the Newlands Project. The impact of the Newlands Project on Pyramid Lake reached a critical point in 1967, when the lake dropped to its lowest level in history and prevented lake fish from migrating upstream to spawn (Simonds 1996: 34). The Pyramid Lake Tribe initiated a series of lawsuits in 1968 intended to stop the falling lake levels. In 1973, the Gesell Opinion required that the Newlands Project reduce the amount of water diverted from the Truckee River at Derby Dam and that any water in excess of Newlands rights be delivered to Pyramid Lake. The passage of the Endangered Species Act in the same year also affected the legal relationship of Pyramid Lake to the Newlands Project (Simonds 1996: 28, 35).

PROPERTY TYPES – If you've extending the P of Sig, you may have other property types

The historic resources of the Newlands Project fall into several property types. They include dams, water conveyance structures, power plants, and pumping plants. National Register guidance documents define the property types as a "grouping of individual properties characterized by common physical and/or associative attributes" and consider it to be the key link between historic context and individual resources (e.g., National Park Service 1991).

Dams

Dams are earthen, rock, and/or concrete structures used to store or divert water. The Newlands Project includes both diversion dams and storage dams.

Diversion Dams

The first dams to be constructed by the project divert water from the Truckee and Carson Rivers into canals. Four diversion dams are incorporated into the Newlands Project (USDI Bureau of Reclamation 1990: 118). Derby Diversion Dam, constructed between October, 1903, and June, 1905, diverts water from the Truckee River into the Truckee Canal, which brought it 32 miles to the lower end of the Carson River. Carson River Diversion Dam, constructed between 1904 and 1905, diverts water from the Carson River five miles northeast and downstream of Lahontan Dam into the southside main Canal (V, L, and S-lines) and the northside main Canal (T-line), which carry water to farms in the vicinity of Fallon, Nevada. Two other diversion dams, Coleman and Sagouspe, were constructed later by the TCID but are part of the Newlands Project. Coleman Diversion Dam is situated downstream from the Carson River Diversion Dam and was constructed in 1935. Sagouspe Diversion Dam is situated downstream from the Coleman Diversion Dam and was constructed in 1940.

Applicable criterion Area of Sig

Derby Diversion Dam consists of a concrete gate structure 31 feet high, a crest length of 170 feet, a volume of 37,000 cubic yards of concrete, and a diversion capacity of 1,500 cubic feet per second. The gate structure is flanked on the left by an earth embankment wing, making the total crest length of the dam 1,331 feet. Near the center of the concrete structure of the dam are a 25- by 10-foot hinged weir gate and thirteen 5- by 10-foot double leaf slide gates. Originally, the dam contained sixteen 5 x 10 feet sluice gates for controlling the river flow (Boyle 1911: 8). The large gate is an alteration made in 1929. Periodic maintenance activities also modified the apron for Derby Dam before its complete replacement in 1999. Adjoining the dam on the right, and at a right angle to it, is a concrete headworks structure for the Truckee Canal. The canal headworks contain nine 5 x 10 feet double leaf slide gates for the control of water into the Truckee Canal.

Carson River Diversion Dam is a concrete gate structure 23 feet high with a crest length of 241.1 feet, a volume of 3,000 cubic yards of concrete, and a diversion capacity of 1,950 cubic feet per second. The outlet works consist of a spillway with twenty-one 5- by 10-foot double leaf slide gates and one 15- by 10-foot gate. The canal headworks consist of three 5- by 15-foot double leaf rising weir gates for the V-Canal and two 7- by 5-foot wood slide gates for the T-Canal.

Coleman Diversion Dam is a concrete weir structure 5.9 feet high with a crest length of 100.1 feet and a diversion capacity of 158.9 cubic feet per second. The dam augments water into the S-line Canal through the S-line diversion channel.

Sagouspe Diversion Dam is an earth and concrete gate structure 12.1 feet high with a crest length of 399.9 feet and a diversion capacity of 38.8 cubic feet per second. The D-canal diverts water from the Carson River just above the Sagouspe Diversion Dam.

Storage Dams

Other dams constructed by the project collect and hold water for later use. Three storage dams are incorporated into the Newlands Project (USDI Bureau of Reclamation 1990: 30). The earliest of these is Lake Tahoe Dam, completed in 1913 at the outlet of Lake Tahoe into the Truckee River. Lake Tahoe Dam increases the water storage capacity of Lake Tahoe and regulates the flow of water from the lake into the Truckee River. The Lake Tahoe Dam is a concrete slab-and-buttress sluice way regulator control structure 18 feet high, a crest length of 108.9 feet, a volume of 400 cubic yards of concrete, and a capacity of 732,000 acre-feet. The outlet works consist of seventeen 5- by 4-foot outlet gates. Safety inspections of the dam in 1978 and 1980 found damage in the concrete apron downstream from the dam and structural problems with the dam's ability to withstand an earthquake (Simonds 1996: 29-30). The inspections led to repair work and structural changes in the dam in 1987 and 1988 (Simonds 1996: 30-31). Alterations included the construction of a new sheet pile wall downstream from the dam, the replacement of the damaged apron with new reinforced concrete, the construction of reinforced concrete stabilizing walls in the existing embankments, the installation of concrete embankment caps over both embankments, and reinforced embankment and slope protection.

The second storage dam to be constructed in the Newlands Project is Lahontan Dam, built between 1911 and 1915 at the lower end of Carson River. Lahontan Dam impounds water from the Carson River drainage basin as well as water diverted from the Truckee River via the Truckee Canal. Lahontan Dam is an earthen and concrete dam 162.1 feet high with a total crest length, including dike, of 5,400 feet, a volume of 733,000 cubic yards of concrete, and a capacity of 317,000 acre-feet. The main embankment, built in the bed of the Carson River, has a crest length of approximately 1,300 feet including a spillway crest 250 feet in length at each end. The two spillways step down with the terrain, curve, and converge on a circular spillway pool 220 feet in diameter. An earthen wing dam or dike about 4 feet high, level with the top of the principal dam, extends southward for three-quarters of a mile. The dam is 20 feet wide at the top and 660 feet wide at the base. A 12 feet wide roadway at the top of the dam is carried across each of the two spillways by five-span continuous reinforced concrete arches with 50-feet spans and five feet rises. The outlet works consists of an outlet tower of massive reinforced concrete in which are set 12 gates at two different elevations. Water from Lahontan reservoir is let into the tower through a nine feet diameter conduit controlled by a hydraulically balanced cylindrical valve at the bottom of the tower. A six feet six inch diameter steel penstock, also controlled by a cylindrical valve, carries water to the Lahontan power plant. A concrete penstock and separate outlet at the left or north side of the dam was abandoned in 1924. All of the gates in the outlet tower are controlled by hydraulic oil pressure provided by an electrically powered pump. The dam has a gatehouse. Other alterations on the dam began as early as 1918, when a gunite coating was used to repair deteriorating concrete in the dam spillways (Simonds 1996: 29). Additional repair work in 1985 covered both spillways and the walls and the floors of the stilling basin with six-inch thick concrete overlays (Simonds 1996: 29).

A third storage dam is sometimes included in discussions of the Newlands Project although technically not a part of it. The Truckee Storage Project constructed Boca Dam between 1937 and 1939 on the Little Truckee River about one mile from its junction or from the confluence of the Truckee River. Boca Dam collects and stores water from the Little Truckee drainage basin, regulates its flow into the Truckee River, and provides supplementary irrigation water for the Truckee Meadows. Boca Dam is a zoned earthfill structure 100 feet high, a crest length of 1,629 feet, and a volume of 912,000 cubic yards of earth. The spillway is 40 feet wide. The outlet works consists of a concrete-lined tunnel in right abutment to two 4 x 4 feet slide gates in the gate chamber; thence two plate steel outlet pipes, controlled by two 42-inch needle valves.

In addition, the Newlands Project includes five small storage dams (USDI Bureau of Reclamation 1990: 30-31). The CCC built the earliest of these between 1935 and 1942. CCC workers completed the S-Canal Dam in 1936. The earth fill dam is 13.1 feet high with a crest length of 8,400 feet and a capacity of 2,000 acre feet. CCC workers also worked on Sheckler Dam, which was completed in 1957. The dam is an earth fill structure 29.9 feet high with a crest length of 23,000 feet and a capacity of 17,000 acre-feet. Other dams within the project area were added later. The Stillwater Point Dam is an earth fill structure constructed in 1945 and is 15.1 feet high with a crest length of 100.1 feet and a capacity of 7,000 acre-feet. Ole's Pond Dam is an earth fill structure constructed in 1954 and is 15.1 feet high with a crest length of 2,600 feet and a capacity of 5,000 acre-feet. Harmon Pasture Dam is an earth fill structure constructed in 1957 and is 7.9 feet high with a crest length of 3,900 feet and a capacity of 1,000 acre-feet.

Water Conveyance Systems

what phase constructed

Another core component of the Newlands Project are the water conveyance and regulating structures used to carry water and control its flow from the storage and diversion structures to the farmlands. They include main canals, lateral canals that carry water from the main canal to irrigation ditches on the farms, drains, and a variety of regulating, diversion, and protective structures. The designation of canals and laterals used in the following sections are the ones currently in use, but other names were used when the system was first built.

how would you group these? district? structure?

Main Canals

All prime lettered canals in the Newlands Project are considered to be main canals. They include the Truckee Canal (TC) and the A, D, E, G, L, N, R, S, T, and V Canals. Rock Dam Ditch 1 and 2 are short main canals situated shortly downstream from Lahontan Reservoir. The Newlands Project includes approximately 122 miles of main canals (USDI Water and Power Resources Service 1981: 689). Between 1903 and 1905, the U.S. Reclamation Service constructed the first of these, the Truckee Canal, which carries water from Derby Diversion Dam 32.5 miles to Lahontan Reservoir (USDI Bureau of Reclamation 1990: 172). In addition, the canal irrigates about 20,000 acres of farmland in the vicinity of Wadsworth and Fernley. The Truckee Canal is approximately 20 feet wide at the bottom, 13 feet deep, both concrete and earth lined, and has a typical maximum water flow of 1,000 to 1,500 cubic feet per second. In addition to the ditch, the canal includes the headworks at Derby Dam, two wasteways regulated by a circular gate to return unwanted water to the river, several control gates, two farm "take-offs" consisting of 15-inch vitrified pipe, and three concrete-lined tunnels ranging in length from 308 feet to 1,520 feet (USDI Bureau of Reclamation 1990: 223). (The Pyramid Branch lateral canal, which was planned to be constructed six miles from the Derby Dam headworks, apparently was never built.) The Truckee canal empties into Lahontan Reservoir, at first through a wooden chute lined with sheet metal and later, after 1911, through a concrete structure (Boyle 1911: 8). Other alterations to the canal occurred in 1927 to repair the cracking of concrete lining in two of the tunnels (Tunnels Numbers 1 and 3) (Simonds 1996: 22). The alterations consisted of placing railroad rails to support the roofs of the tunnels. Some additional repair work on the two tunnels took place in 1971, and the concrete lining of Tunnel Number 3 was replaced completely in 1976 (USDI Water and Power Resources Service 1981: 690). Yet other alterations to the canal occurred between 1935 and 1938, when CCC workers cleaned silt and vegetation out of the canal (Smith 1938: 123). TCID also has removed silt and vegetation from the canal as part of its on-going operations and maintenance responsibilities.

The southside main canal, often referred to as the V-Canal or V-line, carries water from the Carson River east from the Carson River Diversion Dam south of the Carson River to the vicinity of Fallon, Nevada. Constructed from 1904 to 1905, the earthen Canal is 27 miles long,

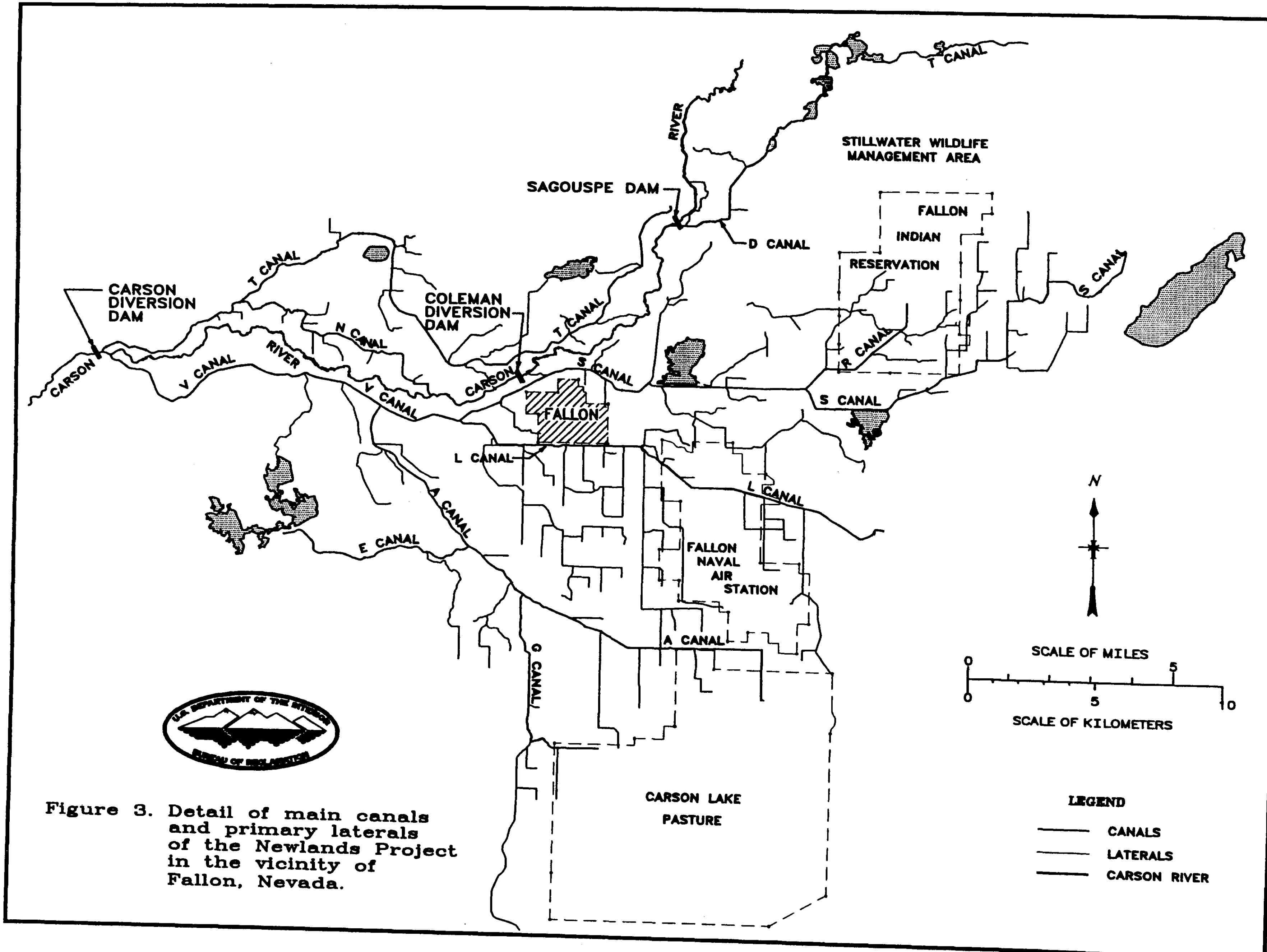


Figure 3. Detail of main canals and primary laterals of the Newlands Project in the vicinity of Fallon, Nevada.

22 feet wide at the bottom, 12 feet deep, and has a typical maximum water flow of 1,500 cubic feet per second (USDI Bureau of Reclamation 1990: 172). It includes a headgate at the Carson River Diversion Dam with three 15 feet by 5 feet double leaf "rising weir" type gate openings, a 26-feet drop and power house 5.8 miles below the headgate, and a combined fall and wasteway 1.25 miles below the power house (Hardesty 1906: 193-217). The S-line, its principal branch, extends the southside main canal an additional 5.28 miles.

The northside main canal, often referred to as the T-Canal or T-line, carries water east from the Carson River Diversion Dam north of the Carson River to the vicinity of Fallon, Nevada. Also constructed between 1904 and 1905, the earthen T-Canal is 9 miles long, 10 feet wide at the bottom, six feet deep, and has a typical maximum water flow of 450 cubic feet per second (USDI Bureau of Reclamation 1990: 172). It includes a headgate at the Carson River Diversion Dam with a single "rising weir" type gate opening. Later, the gate was replaced with two 7- by 5-foot wood slide gates. What was originally named the "U" canal is now designated as the T-line. It has a total length of 55,420 feet (ca. 10.5 miles), a base width that varies from five feet to eight feet, and a depth that ranges from 2.75 feet to four feet.

The A-line begins eight miles below the Carson headworks of the V-line and has a total length of 70,630 feet (ca. 13.4 miles), a base width that varies from four feet to 13 feet, and a depth that ranges from three feet to six feet (Hardesty 1906: 253-254).

Lateral Canals and their Branches

how would you group these?

A lateral canal is a water conveyance structure that draws water from a main canal. Lateral canals or their branches carry water to the approximately 1,000 individual farms in the Project area. The Newlands Project includes 312.1 miles of lateral canals (USDI Water and Power Resources Service 1981: 689). The first laterals were constructed in 1904 (Simonds 1996: 11). Appendix 1 lists the lateral canals in the Newlands Project. They are labeled with a letter and a number (e.g., A1 or S12 or TC5) to indicate the main canal from which they draw water and their relative position along the main canal. Sub-laterals are defined as branches of the lateral canals. They are labeled with a letter and two numbers (e.g., A1-1 or S12-1) to indicate the main canal and lateral canals from which they draw water and their relative position along the lateral canal. Some of the sub-lateral canals also have branches, which are designated as sub-sub-lateral canals and follow the same system of numbering (e.g., A1-1-1).

Drains

A drain is a water conveyance structure that carries water away from irrigated agricultural fields to prevent rising water tables. Drains have been extremely significant water conveyance structures in the history of the Newlands Project. The original engineering plan called for large open trenches spaced ½ mile apart to adequately drain the fields, but cost cutting decisions greatly reduced the size and number of drains. Drains constructed in 1906, therefore, are closely associated with earliest construction of the Newlands Project. As early as 1909, rising water

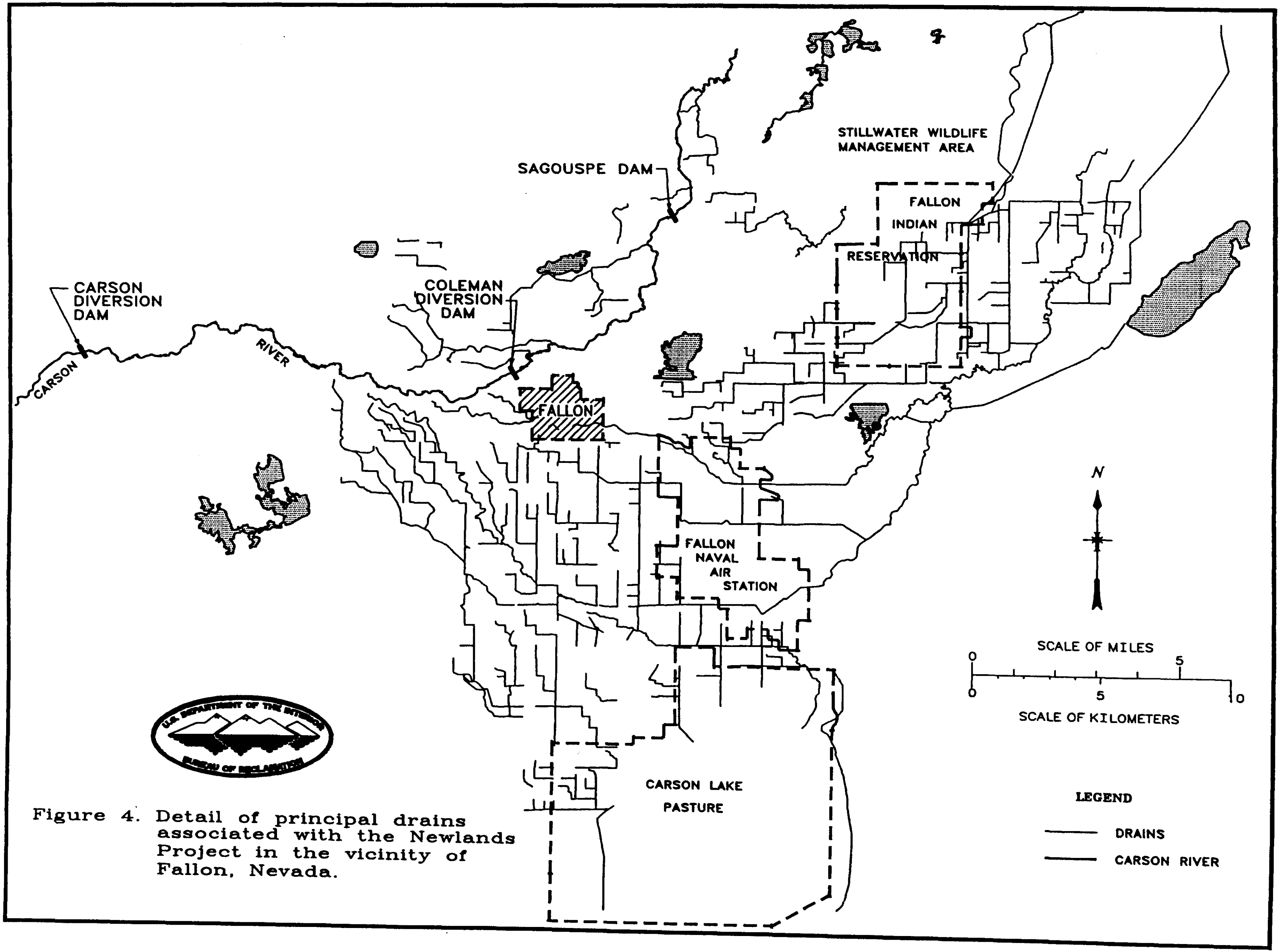


Figure 4. Detail of principal drains associated with the Newlands Project in the vicinity of Fallon, Nevada.

tables and salinization in newly irrigated agricultural fields threatened the failure of the project. The Reclamation Service responded by insisting that the farmers were responsible for draining their own fields. They, however, agreed in 1916 to create a water users association that could contract for the excavation of new drains, and the Truckee-Carson Irrigation District formally came into existence on November 16, 1918 (Truckee Carson Project History 1918). In 1921, work began on the first phase of the project and ended in 1924. Construction crews excavated over 150 miles of deep open drains that were 10 feet deep and nine feet wide at the bottom. The second phase of the project began in 1926 and ended in 1928, completing another 81 miles of drains. Soon afterwards, the water table in the irrigated fields dropped dramatically, causing one Reclamation Service engineer to write that "a real transformation has taken place on the Newlands Project which, in 1921, was practically an alkali bog" (Townley 1998: 47). Drains constructed between 1921 and 1928, therefore, are closely associated not only with the success of the Newlands Project but also with the history of the Truckee-Carson Irrigation District. Finally, drains continued to be built after 1928 to relieve sporadic drainage problems. In all, the Newlands Project includes 345 miles of open drains (USDI Water and Power Resources Service 1981: 689).

Regulating, Diversion, and Protective Structures

Many different types of regulating structures are associated with the canals and drains that carry water to and from individual farms (Aisenbrey et al 1978; Hardesty 1906: 242-252). They include headworks, wasteways, drops, checks, and turnouts. Headworks are structures that control the flow of water from a supply source such as a diversion dam into a main canal. They normally consist of an adjustable gate through which water flows into the canal. Wasteways are protective structures that remove excess water from canals originating in storm runoff or other causes. They typically consist of an overflow or gate in combination with a channel to carry water away from the canal. Drops are structures used to carry water from a higher elevation to a lower elevation and to dissipate the resulting excess energy. They consist of a vertical drop off for short distances of about three feet or less and either rectangular concrete inclines or inclined pipes for longer distances. Checks are used to regulate the amount of water that flows through a canal downstream of and the depth of water upstream of the structure. They are similar to small-scale dams across the canal with gates that can be opened and closed. Turnouts are headgates above the check structures that take water out of the canals and deliver it to the farmer's fields. Sometimes called delivery structures, they normally consist of a stop-gate or a check in the larger canal and a diversion gate set at right angles to it to carry water into the smaller canal. The CCC replaced or added 1,807 water conveyance and regulating structures in the Newlands Project, including headworks, wasteways, drops, checks, and turnouts, between 1935 and 1942 (Pfaff 1999).

how would you group these?

Power Plants

Another use of the Newlands Project is for the generation of hydroelectric power. The Lahontan power plant was constructed in 1911 and was used as a source of power during the construction of Lahontan Dam. Initially, the rectangular stone and concrete structure contained two 500 kilowatt generators manufactured by General Electric and driven by Francis turbines manufactured by the Pelton Waterwheel Company fed by a steel penstock with water from the Truckee Canal (Simonds 1996: 13). The Canyon Power Company, which operated the power plant under a lease agreement, added a third turbine-powered 500 kilowatt generator in 1915 for a total power output of 1,500 kilowatts (Simonds 1996: 18). Upon completion of the dam, they added a secondary concrete penstock feeding water from the reservoir to the primary steel penstock from the Truckee Canal. Power outages, however, sometimes occurred in late summer when the flow from both the canal and the reservoir level dropped too low to use either penstock. To correct the problem, the concrete penstock was replaced with another steel penstock running from the base of the outlet tower into the power house in June of 1925 (Simonds 1996: 21). More modifications to the power plant between 1947 and 1954 upgraded the output of each of the three generators to 640 kilowatts, giving a combined total of 1,920 kilowatts (Simonds 1996: 25). The TCID also installed two new 1,000 kilowatt diesel powered generators next to the Lahontan power plant in 1949 (USDI Water and Power Resources Service 1981: 687). Both of these generators, however, were removed about five years ago. Power plants generate electricity but the transmission of electricity to the consumer requires transmission lines. The TCID "built 73 miles of 33-kilovolt transmission lines from the Lahontan power plant to the city of Fallon; the towns of Fernley, Wadsworth, Hazen, and Stillwater; Indian reservations; and most of the rural areas of the project" (USDI Water and Power Resources Service 1981: 688).

The Newlands Project presently includes one other power plant, which, however, falls outside the 50-year cutoff date for National Register eligibility. Although the base structure (drop structure) was built early in the project, the plant was not completed until 1955. The V-Canal power plant is a rectangular poured concrete structure, approximately 40 x 60 feet in size, and situated at a 26 feet drop in the canal, six miles west of Fallon, Nevada. The power plant, which uses two 400 kilowatt generators, was built by TCID and was operated by Sierra Pacific Power Company, which fed the plant's output into their power grid, for several years. Today, the TCID operates the plant.

Pumping Plants

Another property type in the Newlands Project is the pumping plant, which lifts water to a higher elevation and expands the land area available for irrigation. The pumping plant at Lahontan Dam was constructed in 1924 and used to transport water to the Swingle Bench district (Simonds 1996: 23). Consisting of two 500 horsepower units, the plant pumped water from the reservoir into the Truckee Canal. The project abandoned the pumping plant in 1971, and it no longer exists. Another example of this property type is the Stillwater pumping plant (Malone 1931: 147). (This plant may no longer exist.) In addition, the project includes several small pumping plants that transport water from one canal to another.

Registration Requirements

integrity

Registration Requirements

SIGNIFICANCE CRITERIA

The determination of eligibility of Newlands historic properties for the National Register of Historic Places begins with significance. National Register criteria A-C consider the significance of historic properties to be based upon their ability to convey important aspects of national, state, or local history to the present.

Newlands historic properties are considered to be significant under criterion A if they evoke or illustrate important historical events, themes, or patterns. The project as a whole is significant for its association with the earliest federally funded reclamation project in the United States and early agricultural development of the lower Carson River. A strong association between the historic property and the original federal reclamation project is critical. Some water engineering properties such as minor irrigation ditches and water control devices, for example, are the responsibility of individual farms and, therefore, do not fall under the supervision of the Bureau of Reclamation. Such properties are not considered to be significant under criterion A.

In addition, the properties may be significant under criterion B if they illustrate the lives of people who made important contributions to history. The project as a whole, for example, is significant under criterion B for its association with Francis G. Newlands. Specific properties also may be significant for their association with the careers of master architects and engineers who designed the dams, canals, and other components of the Project.

The Newlands historic properties also may be significant under criterion C as good examples of the work of an important architect or engineer or as good examples of important architectural or engineering types, patterns, styles, methods, or time periods. They include, for example, dams, canals, power plants, or pumping stations with distinctive characteristics or that were the first of their kind or that play critical roles in the water engineering system. Specific properties may be significant as the only example or the earliest or last of its type in the Project (e.g., diversion dam). Other benchmarks are capacity and length. Is it, for example, the largest of its type (e.g., storage dam as measured by cubic feet of fill or acre-feet of water storage; canal as measured by length and cubic feet per second of water flow)? Is the property an example of a new or innovative or experimental approach to water engineering in the Project?

Finally, the historic properties in the Newlands Project may be significant under criterion D for the information that they contain about important scholarly and scientific issues useful in interpreting the past. Some of the key research issues, for example, include historical changes in the Newlands landscape, settlement patterns, and water engineering technology. Historic properties potentially significant under criterion D include the archaeological remains of construction camps such as Lahontan City, ditch rider houses, experimental farms, and the like.

Period of Significance

The Newlands Project is first and foremost nationally significant as the earliest federally funded reclamation project in the United States. Its association with the federal government, and, specifically, the Bureau of Reclamation, therefore, is critical. The period of time during which the project is directly associated with the federal government, however, is limited. In 1926,, the operation and maintenance of the project was transferred to the TCID, thus ending its direct association with the Bureau of Reclamation. For this reason, the period of significance of the Newlands Project is defined as 1903, when construction began on the project, until 1926, when management of the project was transferred to the TCID.

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Integrity Criteria

The National Register of Historic Places requires that historically significant properties retain enough integrity to convey their significance to the present. What is meant by "retain enough integrity," however, depends upon the resource type being evaluated and the criteria used to determine significance. Significance under criterion D, for example, does not carry the same standard of integrity as significance under criterion A. Likewise, the standards of integrity for an elaborately engineered canal network are quite different from those for small scale irrigation ditches in farm fields.

Elements of Integrity

To assist in setting standards, the National Register defined seven elements of integrity: workmanship, materials, design, setting, location, feeling, and association (1991b: 44-45). The importance of each of the elements varies with resource type and significance criterion. Criteria A, B, and C, for example, all require that the historic property look much like it did during its period of significance. The elements of location, design, materials, and association are most important in assessing integrity under criteria A and B, both of which emphasize the historic fabric of standing buildings and structures. Criterion C places more emphasis upon workmanship, materials, and design, all of which are related to an engineering or architectural style, pattern, type, method, or master. Integrity of association, in contrast, is most important to Criterion D, which requires a close link between the historic property and the information requirements of scientific or scholarly research questions.

Workmanship is defined as "the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory" (National Park Service 1991b: 45). Integrity of workmanship is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of workmanship is whether or not the historic property retains recognizable physical evidence of significant water works associated with the Newlands Project or the work of a master architect or engineer.

Materials is defined as "the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property" (National Park Service 1991b: 45). Integrity of materials is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of materials is whether or not the historic property retains recognizable physical evidence of the materials used in significant water works associated with the Newlands Project or in the work of a master architect or engineer.

Design is defined as "the combination of elements that create the form, plan, space, structure, and style of a property" (National Park Service 1991b: 44). Integrity of design is most important under Criterion C, which places emphasis upon an engineering or architectural style, pattern, type, method, or master. This element is especially important in evaluating the integrity of engineer- or architect-designed properties in the project such as dams, major feeder canals such as the Truckee Canal, power plants, and pumping stations. The benchmark for determining integrity of design is whether or not the historic property retains recognizable physical evidence of the configuration of significant water works associated with the Newlands Project or in the work of a master architect or engineer.

Setting is defined as "the physical environment of a historic property" (National Park Service 1991b: 45). Integrity of setting focuses upon the original landscape and viewshed and the extent to which they have been changed. Without question, urbanization and the Fallon Air Station are the key threats to integrity of setting in the Newlands Project, both of which impinge upon the rural character of the original project. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. Integrity of setting is most important under criteria A and B and to a lesser extent under criterion C. This element usually is not important in determining eligibility under criterion D. The benchmark for determining integrity of setting is whether or not the historic property has retained a rural character.

Location is defined as "the place where the historic property was constructed or the place where the historic event occurred" (National Park Service 1991b: 44). Integrity of location is most important under criteria A and B and to a lesser extent under criteria C and D. In the latter case, however, secondary archaeological deposits usually contain less information than primary deposits that have not moved from the original place of deposition. Integrity of location is closely linked with integrity of association. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. The benchmark for determining integrity of location is whether or not the historic property is still in its original location or, in the case of a linear water conveyance structure, follows its original alignment.

Feeling is defined as "a property's expression of the aesthetic or historic sense of a particular period of time" (National Park Service 1991b: 45). Without question, urbanization and the Fallon Air Station are the key threats to integrity of feeling in the Newlands Project, both of which impinge upon the rural character of the original project. This element is especially important in evaluating the integrity of minor canals and drains that have not been elaborately engineered. To what extent have they retained their rural setting? Integrity of feeling is most important under criteria A and B and to a lesser extent under criterion C. This element usually is not important in determining eligibility under criterion D. The benchmark for determining integrity of feeling is whether or not the historic property has retained a rural character.

Association is defined as "the direct link between an important historic event or person and a historic property" (National Park Service 1991b: 45). Integrity of association is especially important if significance is based upon criterion A or B. The association of historic properties in the Newlands Project with the original period of construction is a good example. Integrity of location is closely linked to integrity of association. The movement of historic properties away from their original location, for example, often destroys the association between the property and historic events that took place there. The benchmark for determining integrity of association is whether or not the historic property still retains enough visibility, historic fabric, and location to convey its historic past.

Existing Integrity

The Newlands Project is an ongoing dynamic system. Therefore, it is not surprising that some components in most of the historic properties associated with water engineering in the Project have been replaced, repaired, or modified since their construction. Gates and needle valves, for example, have been replaced in the dams and turnouts or checks replaced in the canals. The historic fabric of these properties, however, is still essentially intact. That is, they still retain integrity of workmanship, materials, and design. Some of the canals have been piped and filled in, however, thereby losing integrity of association but continuing their historic use. The Project also includes many abandoned canals and drains that still follow their original alignment and are quite visible, thereby retaining integrity of association. Finally, it is clear that the Project is rapidly losing integrity of setting and feeling through the forces of urbanization and military training activities at the Fallon Naval Air Station. These elements of integrity, however, are considered to be minor in determining significance under criterion C and, therefore, may not be a threat to the water engineering properties in the Project.

CONTRIBUTING AND NONCONTRIBUTING PROPERTIES

1942

Dams

Period of Significance: The period of significance for dams in the Newlands Project begins in 1903 with the start of construction on Derby Diversion Dam and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of dams in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. They are core components of the Newlands Project and provide storage and diversion structures for water distribution, regulation, and flood control throughout the region. Dams are contributing resources when they are strongly associated with the Newlands Project and with period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Diversion Dams divert water for distribution. They are considered to be important in the Newlands water distribution network when they have exceptional size. The size of diversion dams is measured by water diversion rates in cubic feet per second (cfs), which varies from 1,950 cfs (Carson River Diversion Dam) to 38.8 cfs (Sagouspe Dam) in the Newlands Project. Diversion dams with exceptional size are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Project. Derby Diversion Dam and Carson River Diversion Dam are both considered to be contributing resources and are currently listed on the National Register.

Storage Dams store and regulate water. They are considered to be contributing if they have sufficient capacity to be important in regulating water fluctuations, if they meet the criteria of integrity, fall within the period of significance, and are strongly associated with the project. Lake Tahoe Dam and Lahontan Dam are both considered to be contributing and are currently listed on the National Register. They are considered to be important because of their exceptionally large water capacity (732,000-314,000 acre-feet) and key role in providing adequate water to the project during times of drought. Boca Dam, although currently listed on the National Register, is considered to be noncontributing because it is not strongly associated with the Newlands Project. The size of the other dams in the project is quite small and varies from 17,000 acre-feet to 1,000 acre-feet. Stillwater Point Dam, Ole's Pond Dam, and Harmon Pasture Dam are considered to be noncontributing resources not only because of their small size but also because they fall outside the period of significance.

Integrity: Certainly, dams must have integrity of location to be eligible for listing on the National Register. Assessing their overall integrity, however, must reflect the fact that the Newlands Project is an ongoing dynamic system with many components that have been replaced, remodeled, or repaired over the years. For this reason, the elements of design, workmanship, and materials should be considered in broad perspective (cf. Pfaff 1998: 48). The integrity of a dam is retained, for example, even if needle valves or gates have been replaced as long as the original design, use, or character of the dam is not significantly changed. In the same sense, a dam's integrity of setting is retained if the character of the original setting is still apparent without significant intrusions. A dam also will retain integrity of feeling and association if the other elements of integrity are intact.

Water Conveyance Systems

Period of Significance: The period of significance for water conveyance structures in the Newlands Project begins with the start of construction of the Truckee Canal in 1903 and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of the water conveyance structures in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Water conveyance structures are important as key components in the Newlands Project for transporting water from the Truckee River and Carson River to storage dams and from there to the farms. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Main Canals are the primary arteries of the Newlands Project water distribution network. They are considered to be important water conveyance structures and, therefore, are contributing resources if they meet the criteria of integrity and fall within their period of significance. They all have lengths ranging from a little over two miles (N-line Canal) to 32 miles (The Truckee Canal) and cross-sections ranging from 60 square feet (T-Canal) to 260 square feet (Truckee Canal). They have diversion capacities (water flow rates) ranging from 450 cubic feet per second (T-Canal) to 1,500 cubic feet per second (Truckee Canal, V-Canal). Of the main canals, the Truckee Canal, the V-Canal, and the T-Canal were the first to be constructed and are currently listed on the National Register. The other main canals that contribute to the Newlands Project district include the A-line, the D-line, the E-line, the G-line, the L-line, the N-line, the R-line, and the S-line.

Lateral Canals and their branches (i.e., sub-lateral or sub-sub-lateral) are the secondary arteries of the Newlands Project water distribution network. Only lateral canals with exceptional size and importance are considered to be important water conveyance structures. Exceptional size is measured by length, cross-section, and cubic feet per second (cfs). To have exceptional size, a lateral canal or branch must be at least one mile in length and have a cross-section of at least 60 square feet. The length of laterals in the Project varies from 250 feet to a little over eight and a half miles. Of these, 126 are at least one mile long (Appendix). Such large size lateral canals are considered to be contributing only if they also have exceptional importance, which is measured by the number of users. To have exceptional importance, a lateral canal must be associated with three or more users. Lateral canals that have been determined to have exceptional size and importance are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Sub-lateral canals and their branches (e.g., sub-sub-laterals) are not considered to be contributing resources.

Drains are considered to be important water conveyance structures only if they have exceptional size and importance. Determining what drains are contributing is helped by a drain classification system used by the Newlands Project at least as early as 1920 that defined three categories based on size and relative importance to the drainage system (Reclamation Service map, January 23, 1920). In this system, Class 1 or "deep" drains are the largest and most important, followed by Class 2 and then by Class 3, the least important. The typical size of Class 1 deep drains constructed between 1921 and 1928 is 10 feet deep and nine feet wide at the bottom (Simonds 1996: 20, Townley 1998: 47). Deep drains constructed during the CCC period between 1936 and 1942 followed the same pattern. All Class 1 deep drains are considered to be important water conveyance structures if they have a length of at least one mile and, therefore, are contributing resources if they retain integrity, fall within the period of significance, and are strongly associated with the Newlands Project. The length of drains in the Project varies from 299 feet (Carson Lake 1 BR-2) to about 12 miles (L Deep Drain, Lower Diagonal Deep Drain). Of these, 120 drains are one mile or more in length and, therefore, are considered to be contributing resources (Appendix). All Class 2 and 3 "surface" drains in the Newlands Project are considered to be noncontributing resources.

Regulating, Diversion, and Protective Structures control the flow of water through the canals and drains. They are considered to be important when they play a major role in water regulation or when they are unique representations of an engineering or architectural type or pattern. All canal headworks are important and, therefore, are considered to be contributing resources if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Wasteworks are considered to be contributing resources only as good examples of this type of structure and if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. Turnouts, drops, and checks in the Newlands Project are considered to be contributing resources only as good examples of a distinctive type of water control structure and if they meet the criteria of integrity, fall within their period of significance, and are strongly associated with the Newlands Project. They are considered to be noncontributing if they are associated with sub-laterals or their branches.

Integrity: Like other components of the Newlands Project as an ongoing system, the water conveyance structures have been repaired or modified since their construction and after their period of significance. The alterations, however, do not necessarily mean loss of integrity if the location (alignment) is the same and the overall design, setting, and feeling are retained (cf. Pfaff 1998: 50). Abandoned water conveyance structures may still be eligible if they are visible, maintain their original alignment, and still convey their historical association with the Newlands

Project. Altering the canal or drain by adding pipe and filling in the structure, however, destroys the historical association but still retains the historical use of the structure.

The integrity of water conveyance structures and associated features varies with how much of their original use and design is still intact. Supernowicz (1990) developed integrity criteria for water conveyance structures on the El Dorado National Forest that are applicable to the Newlands Project as well. They include the extent to which the structure has been altered, the extent to which the structure has retained its original form (morphology, profile, and design elements), and the extent to which the structure has retained associated features such as turnouts, checks, drops, and wasteways. At one end of the integrity scale, the water conveyance structures with the highest integrity have undergone no recent alterations or significant erosion. They also have retained their original form and have retained all of the features, which also retain their original form and appearance, associated with either the design or original use of the structure. At the other end of the scale, the structures with the lowest integrity have undergone more than 50 percent alteration and have lost all associated features. Recent concrete lining of unlined canals is not considered to be an important loss of integrity if it doesn't significantly change the overall morphology or appearance of the structure.

Power Plants

Period of Significance: The period of significance begins with the construction of the power plant at the Lahontan Dam in 1911 and ends in 1926 with the transfer of the Project to the TCID.

Significance: The significance of power plants in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Power plants are important as key components in the Newlands Project for generating electric power. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in electric power generation. Electric power was considered to be one of the secondary benefits of the Newlands Project. Hydroelectric power generated from the fall of the Truckee Canal at the site of Lahontan Dam was used as a source of power during the construction of the dam between 1911 and 1915. The Lahontan plant, for example, powered what may have been the first electric shovel to be used on a construction site. After its completion in 1915, the Lahontan power plant used both the penstock from the Truckee Canal and the penstock from the outlet tower of the dam to generate hydroelectric power.

Integrity: The integrity of power plants must be judged as an ongoing system that needs periodic maintenance, repair, and replacement of parts. Retention of the overall design, however, is important (cf. Pfaff 1998: 58). The Lahontan power plant, for example, increased the capacity of its three generators to 640 kilowatts each between 1947 and 1954 without significantly changing the design of the plant. The TCID installed two new 1,000 kilowatt diesel powered generators next to the Lahontan power plant in 1949 (USDI Water and Power Resources Service 1981: 687). Both of these generators, however, were removed about five years ago.

Pumping Plants

Period of Significance: 1924-1926

Significance: The significance of pumping plants in the Newlands Project is primarily under Criterion A for their association with the earliest federally funded reclamation project in the United States and for their association with the agricultural development of the lower Carson River basin. Pumping plants make possible the transfer of water into otherwise inaccessible areas. They are considered to be contributing resources when they are associated with the period of significance or have exceptional significance, retain integrity, and play an important role in the management of water flowing through the Newlands Project.

Integrity: The pumping plants no longer exist.

CONCLUSIONS

The resources that contribute to the National Register eligibility of the Newlands Reclamation Project convey the key components of the project's water engineering network during its' period of significance from 1906 until 1926. Contributing resources come from the property types of dams, water conveyance structures, power plants, and pumping stations. The significance of contributing resources is derived mostly from criteria A and C. Many of the resources in the project contribute under criterion A because of their strong association with specific historical events, themes, and patterns. They include, for example, dams and canals that convey the characteristics of the first federally funded irrigation project in the United States. The resources that contribute in this way must be (1) associated with the original construction of the Newlands Project, (2) a "core" water engineering component (e.g., large storage dam or a main canal), and (3) under federal management. Drains are considered to be contributing under criterion A if they are associated with the early period of drain construction from 1921 to 1926 as a physical expression of the engineering response to the drainage problems that developed early in the operation of the project. To be considered as contributing under criterion A, historic properties in the Newlands Project must have retained integrity of feeling, setting, design, location, and association. Both feeling and setting are being threatened by urbanization and by military activities at the Fallon Naval Air Station.

Some resources in the Project are considered to be contributing under criterion C is they are good examples of distinctive architectural or engineering patterns, styles, types, or periods. Dams, for example, are considered to be contributing under criterion C if they are good examples of water storage or diversion structures in the Project at the time of its construction. Criterion C requires that historic properties retain integrity of design, workmanship, and materials to be contributing.

Finally, archaeological or other resources in the Project are considered to be contributing under criterion D if they are a good source of information about the workers who lived in the early construction camps or about environmental changes brought about by the Project. To be considered contributing under this criterion, historic properties in the Newlands Project must have retained integrity of association, design, and location.

What remains to be done in the future? As discussed in the introduction, this report does not consider several themes that may be important in considering the significance of some cultural resources in the Newlands Project. In particular, these themes include the CCC, historic landscapes, farming and agricultural life, migrants, and work camps (e.g., the site of the construction camp of Lahontan City). These themes should be developed in future guidance documents for management of cultural resources in the Newlands Project National Register District.

Specific recommendations, therefore, are to develop the following thematic contexts:

- CCC's role in the operation, maintenance, and development of the Newlands Project.
- "Transforming Environments" that would consider, in particular, the historic landscapes associated with agriculture in the Newlands Project.
- "Peopling Places" that would focus upon the migrants who moved to and settled in the Newlands Project.
- "Workers and Work Culture" that would focus upon, for example, the Newlands Project construction camps, CCC camps, and farmers.
- "Expanding Science and Technology" is a theme that would consider, in particular, the development of technological innovations and applications in irrigation farming practices in the Newlands Project. The Reclamation Service, for example, established an experimental farm in 1906 "to test cultivation methods and seed strains" (Townley 1998: 28). Local newspapers published the results of such experiments so that farmers could take advantage of the information. Later, the University of Nevada, Reno, took over the experimental farm as part of its extension service. Experimental farms also are associated with other federal reclamation projects.

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Appendix 1

Drains and Laterals from the Newlands Project: Contributing and Noncontributing Elements to the National Register of Historic Places District

Newlands Project Canals and Laterals from Fallon and Fernley, Nevada and Their National Register Contributing Status							
Main Canal	**Lateral**	**Date**	**Length**	**Cross-Section**	**Volume (CFS)**	**Integrity**	**NRHP Contributing Element**
A-Line	--	pre-1926	>1 mile			yes	**yes**
	A1	pre-1926	>1 mile			yes	**yes**
	A2	pre-1926	>1 mile			yes	**yes**
	A3	pre-1926				yes	no
	A4	pre-1926	>1 mile			yes	**yes**
	A5	pre-1926	>1 mile			yes	**yes**
	A5-1	pre-1926	>1 mile			yes	**yes**
	A6	pre-1926	>1 mile			yes	**yes**
	A7	pre-1926				yes	no
	A8	pre-1926				yes	no
	A9	pre-1926				yes	no
	A9-3	pre-1926	>1 mile			yes	**yes**
	A9-4	pre-1926	>1 mile			yes	**yes**
	A9-5	pre-1926	>1 mile			yes	**yes**
	A10 (G-line)	pre-1926	>1 mile			yes	**yes**
	A11	pre-1926				yes	no
	A12	pre-1926	>1 mile			yes	**yes**
	A13	pre-1926				yes	no
	A14	pre-1926				yes	no
	A15	pre-1926	>1 mile			yes	**yes**
	A16	pre-1926				yes	no
	A17	pre-1926				yes	no
	A18	pre-1926	>1 mile			yes	**yes**
	A19	pre-1926	>1 mile			yes	**yes**
	A19-1	pre-1926	>1 mile			yes	**yes**
	A20	pre-1926				no	no
	A21	pre-1926	>1 mile			no	no
D-Line	--	pre-1926	>1 mile			yes	**yes**
	D1	pre-1926	>1 mile			yes	**yes**
	D2	pre-1926	>1 mile			yes	**yes**
	D3	pre-1926	>1 mile			no	no
	D4	pre-1926	>1 mile			unknown	**yes**
	D5	pre-1926	>1 mile			unknown	**yes**
E-Line	--	pre-1926	>1 mile			yes	**yes**
	E1	pre-1926	>1 mile			yes	**yes**
	E2	pre-1926				unknown	no
	E3	pre-1926	>1 mile			unknown	**yes**
	E4	pre-1926	>1 mile			unknown	**yes**
	E5	pre-1926	>1 mile			unknown	**yes**
G-Line	--	pre-1926	>1 mile			yes	**yes**
	G1	pre-1926				yes	no
	G2	pre-1926				yes	no
	G3	pre-1926	>1 mile			no	no
	G4	pre-1926	>1 mile			yes	**yes**
	G5	pre-1926	>1 mile			yes	**yes**

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	G6	pre-1926				unknown	no
	G7	pre-1926	>1 mile			unknown	**yes**
L-Line	--	pre-1926	>1 mile			yes	**yes**
	L1	pre-1926	>1 mile			yes	**yes**
	L1-1	pre-1926	>1 mile			unknown	**yes**
	L1-4	pre-1926	>1 mile			unknown	**yes**
	L1-7	pre-1926	>1 mile			unknown	**yes**
	L1-8	pre-1926	>1 mile			unknown	**yes**
	L1-10	pre-1926	>1 mile			unknown	**yes**
	L2	pre-1926				yes	no
	L3	pre-1926	>1 mile			no	no
	L4	pre-1926	>1 mile			yes	**yes**
	L5	pre-1926				yes	no
	L6	pre-1926	>1 mile			yes	**yes**
	L7	pre-1926				yes	no
	L8	pre-1926	>1 mile			yes	**yes**
	L8-2	pre-1926	>1 mile			unknown	**yes**
	L8-3	pre-1926	>1 mile			unknown	**yes**
	L8-4	pre-1926	>1 mile			unknown	**yes**
	L9	pre-1926	>1 mile			yes	**yes**
	L10	pre-1926	>1 mile			yes	**yes**
	L10-1	pre-1926	>1 mile			unknown	**yes**
	L11	pre-1926				yes	no
	L12	pre-1926	>1 mile			yes	**yes**
N-Line	--	pre-1926	>1 mile			yes	**yes**
	N1	pre-1926				yes	no
	N2	pre-1926				yes	no
	N3	pre-1926	>1 mile			yes?	**yes**
	N4	pre-1926				no	no
	N5	pre-1926				yes	no
	N6	pre-1926				yes	no
	N7	pre-1926				yes	no
	N8	pre-1926				yes?	no
	N9	pre-1926				yes?	no
	N10	pre-1926				yes	no
	N11	pre-1926				no	no
	N12	pre-1926				no	no
	N13	pre-1926				unknown	no
	N14	pre-1926				unknown	no
	N15	pre-1926				unknown	no
	N16	pre-1926				unknown	no
	N17	pre-1926				unknown	no
R-Line	--	pre-1926				yes	**yes**
	R1	pre-1926				yes	no
	R2	pre-1926	>1 mile			yes	**yes**
	R3	pre-1926				yes	no
	R4	pre-1926	>1 mile			yes	**yes**
	R5	pre-1926				yes	no

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	R6	pre-1926	>1 mile			yes	**yes**
	R7	pre-1926	>1 mile			unknown	**yes**
	R8	pre-1926				unknown	no
	R9	pre-1926	>1 mile			unknown	**yes**
	R10	pre-1926				unknown	no
	R11	pre-1926	>1 mile			unknown	**yes**
	R11-1	pre-1926	>1 mile			unknown	**yes**
S-Line	--	pre-1926	>1 mile			yes	**yes**
	S1	pre-1926				yes	**yes**
	S2	pre-1926	>1 mile			yes	**yes**
	S3	pre-1926				yes	no
	S4	pre-1926	>1 mile			yes	**yes**
	S5	pre-1926	>1 mile			yes	**yes**
	S6	pre-1926	>1 mile			yes	**yes**
	S6-4	pre-1926	>1 mile			unknown	**yes**
	S6-6	pre-1926	>1 mile			unknown	**yes**
	S7	pre-1926	>1 mile			yes	**yes**
	S7-3	pre-1926	>1 mile			unknown	**yes**
	S8	pre-1926	>1 mile			yes	**yes**
	S9	pre-1926				yes	no
	S10	pre-1926	>1 mile			yes	**yes**
	S11	pre-1926				yes	no
	S12	pre-1926				yes	no
	S13	pre-1926	>1 mile			yes	**yes**
	S14	pre-1926				yes?	no
	S15	pre-1926				yes	no
	S16	pre-1926				yes	no
	S17	pre-1926	>1 mile			yes	**yes**
	S18	pre-1926				yes	no
	S19	pre-1926	>1 mile			no	**yes**
	S20	pre-1926				no	no
	S21	pre-1926				yes	no
	S22	pre-1926	>1 mile			yes	**yes**
	S23	pre-1926				yes	no
	S24	pre-1926				yes	no
	S25	pre-1926				yes	no
T-Line	--	pre-1926				yes	**yes**
	T1	pre-1926				yes	no
	T2	pre-1926				yes	no
	T3	pre-1926				no	no
	T4	pre-1926	>1 mile			yes	**yes**
	T5	pre-1926	>1 mile			yes	**yes**
	T6	pre-1926	>1 mile			yes	**yes**
	T7	pre-1926	>1 mile			yes	**yes**
	T8	pre-1926				yes	no
	T9	pre-1926				yes	no
	T10	pre-1926				no	no
	T11	pre-1926	>1 mile			yes	**yes**

Main Canal	Lateral	Date	Length	Cross-Section	Volume (CFS)	Integrity	NRHP Contributing Element
	T12	pre-1926				yes	no
	T13	pre-1926	>1 mile			yes	**yes**
	T14	pre-1926				yes	no
	T15	pre-1926				yes	no
	T16	pre-1926	>1 mile			yes	**yes**
	T17	pre-1926				no	no
	T18	pre-1926				yes	no
TruckeeCanal	--	pre-1926	>1 mile			yes	**yes**
	TC1	pre-1926				unknown	no
	TC2	pre-1926	>1 mile			unknown	**yes**
	TC3	pre-1926				unknown	no
	TC4	pre-1926	>1 mile			unknown	**yes**
	TC5	pre-1926	>1 mile			unknown	**yes**
	TC6	pre-1926	>1 mile			unknown	**yes**
	TC7	pre-1926				unknown	no
	TC8	pre-1926				unknown	no
	TC9	pre-1926				unknown	no
	TC10	pre-1926				unknown	no
	TC11	pre-1926				unknown	no
	TC12	pre-1926	>1 mile			unknown	**yes**
	TC12-2	pre-1926	>1 mile			unknown	**yes**
	TC13	pre-1926	>1 mile			unknown	**yes**
	TC13-1	pre-1926	>1 mile			unknown	**yes**
V-Line	--	pre-1926	>1 mile			yes	**yes**
	V1	pre-1926				yes	no
	V2	pre-1926				yes	no
	V3	pre-1926				yes	no
	V4	pre-1926				yes	no
	V5	pre-1926				yes	no
	V6	pre-1926				yes	no
	V7	pre-1926				yes	no
	V8	pre-1926				yes	no
	V9	pre-1926				no	no
	V10	pre-1926				yes	no
	V11	pre-1926				yes	no
	V12	pre-1926				unknown	no

Newlands Project Drainage Features and Their Contributing Status Found in the Vicinity of Fallon, Navada						
Drain	**Sub-Drain**	**Canal Affiliations**	**Length**	**Date**	**Integrity**	**NRHP Contributing Element**
Allyn		L1		pre-1926	yes	no
B		A1		pre-1926	yes	no
Bria		N17, end of N-Line		pre-1926	yes	no
Buerer		S11,13		pre-1926	yes	no
C1B		L4		pre-1926	yes	no
C1X		L4		pre-1926	yes	no
C3X		L1		pre-1926	yes	no
C4A	Br.1	L1		pre-1926	yes	no
C4B		L1, end of L1		pre-1926	yes	no
Carson Lake		A12,15,16	>1 mile	pre-1926	yes	**yes**
Carson Lake 1	deep	A15; G1,4	>1 mile	pre-1926	yes	**yes**
Carson Lake 1-A	Br.1, Deep, Ext.	A9; G1,2		pre-1926	yes	no
Carson Lake 3	Br.1	A15		pre-1926	yes	no
Casebolt		S19, lower S-Line		pre-1926	yes	no
City Ditch		L2		pre-1926	yes	no
Clevenger		A9		pre-1926	yes	no
Cline		A15		pre-1926	yes	no
Conley	Br.1	A16		pre-1926	yes	no
Coverston		A15		pre-1926	yes	no
D1A		L8		pre-1926	yes	no
D3		L8	>1 mile	pre-1926	yes	**yes**
D3X		L8		pre-1926	yes	no
D5A		L8		pre-1926	yes	no
D5B		end of L8	>1 mile	pre-1926	yes	**yes**
D5X		L8		pre-1926	yes	no
Dalton		G3,5		pre-1926	yes	no
Danielson		S6		pre-1926	yes	no
Dean		V3		pre-1926	yes	no
Dearmond		S24,25		pre-1926	yes	no
Dodge		S17		pre-1926	yes	no
Douglass Deep		G1, Upper G-Line	>1 mile	pre-1926	yes	**yes**
Downs		A16,17	>1 mile	pre-1926	yes	**yes**
Droz-Dodge		S6		pre-1926	yes	no
E2A		L10		pre-1926	yes	no
E3A		L10	>1 mile	pre-1926	yes	**yes**
E3B		L10	>1 mile	pre-1926	yes	**yes**
E4A		L10	>1 mile	pre-1926	yes	**yes**
E4X		L8	>1 mile	pre-1926	yes	**yes**
E5X		L8		pre-1926	yes	no

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
East Ditch		end of L12, Carson Lake Pasture		pre-1926	yes	no
East Lee		A19,21, end of A-Line	>1 mile	pre-1926	yes	**yes**
Emigrant		north of T4,5	>1 mile	pre-1926	yes	**yes**
Erb		end of T-Line	>1 mile	pre-1926	yes	**yes**
Evans		S6		pre-1926	yes	no
F1		D2	>1 mile	pre-1926	yes	**yes**
F1M		D2		pre-1926	yes	no
F2		D1,2	>1 mile	pre-1926	yes	**yes**
F3		A9; end of E1		pre-1926	yes	no
F3B		L10		pre-1926	yes	no
Fernley	1, A, A1-BR4	TC1 through TC10	>1 mile	pre-1926	yes	**yes**
Fowler		A15		pre-1926	yes	no
Freeman-Sears		S13		pre-1926	yes	no
G Line		G2	>1 mile	pre-1926	yes	**yes**
G4		G1		pre-1926	yes	no
Getto		T14,(16?)		pre-1926	yes	no
GF		G5	>1 mile	pre-1926	yes	**yes**
GH		G3,5		pre-1926	yes	no
Gott		S16		pre-1926	yes	no
Grimes		S2		pre-1926	yes	no
Grimes Slough	ext	A20,21; L12	>1 mile	pre-1926	unknown	**yes**
Gummow		A9; E1	>1 mile	pre-1926	yes	**yes**
Gummow 4		end of E1		pre-1926	yes	no
Hagen	Br.1	V7		pre-1926	yes	no
Harmon	Ext., Deep	R1; S6,8,12,14, end of S-Line		pre-1926	yes	no
Harmon 1	deep	S6,7,10,11	>1 mile	pre-1926	yes	**yes**
Harmon 2	Br.1, Deep	S6,8,12	>1 mile	pre-1926	yes	**yes**
Harmon 9	Ext.	S6		pre-1926	yes	no
Harmon/S2 Spill		S-Line, Harmon Reservoir		pre-1926	yes	no
HarmonInlet(S1B)	—	—		pre-1926	yes	no
Hazen		TC11,12	>1 mile	pre-1926	yes	**yes**
Hazen 2		TC12		pre-1926	yes	no
Heinze		T11		pre-1926	yes	no
Holmes	BR1, deep	G3,5	>1 mile	pre-1926	yes	**yes**
Humphrey's		S17		pre-1926	yes	no
I-A	Br.1, Ext.	A9		pre-1926	yes	no
Inglis		V2		pre-1926	yes	no
J1	BR4, deep	A19,20,21, end of A-Line; L8,12	>1 mile	pre-1926	unknown	**yes**
J1E		A21		pre-1926	yes	no

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
Javis	Ext.	A11		pre-1926	yes	no
J. B. Eason		L8		pre-1926	yes	no
Jones		end of V1		pre-1926	yes	no
Keddie		S1; end of V-Line	>1 mile	pre-1926	yes	**yes**
Kennedy	Diversion	G2		pre-1926	yes	no
Kent		S22, end of S-Line	>1 mile	pre-1926	yes	**yes**
Kent Lake	deep	R9; S17,22	>1 mile	pre-1926	yes	**yes**
L	deep	L1,4; V6,8	>1 mile	pre-1926	yes	**yes**
L1		L8	>1 mile	pre-1926	yes	**yes**
L2	BR1, deep	L1	>1 mile	pre-1926	yes	**yes**
L3	Br.1	L5, 8		pre-1926	yes	no
L4		L1		pre-1926	yes	no
L5		L1		pre-1926	yes	no
L6		L1		pre-1926	yes	no
L8		L8	>1 mile	pre-1926	yes	**yes**
L9		L4		pre-1926	yes	no
L12		L4	>1 mile	pre-1926	yes	**yes**
Laist		S6		pre-1926	yes	no
Lambright		A4		pre-1926	yes	no
Law		N8,9		pre-1926	unknown	no
LD		L1,2,4,5; V11	>1 mile	pre-1926	yes	**yes**
LE		L10		pre-1926	yes	no
Lower Diagonal	deep	L8,12	>1 mile	pre-1926	yes	**yes**
Lower Diagonal 1	Br.1,2,6-8	L8,10		pre-1926	yes	no
Lower Diagonal 2		L8		pre-1926	yes	no
Lower Hazen	Br.	TC11,12	>1 mile	pre-1926	yes	**yes**
Lower Soda Lake	Br.1,3	T13,15,16,18	>1 mile	pre-1926	yes	**yes**
Malm		A9	>1 mile	pre-1926	yes	**yes**
Mauz		T11		pre-1926	yes	no
McCuskey		end of S-Line		pre-1926	yes	no
McLean		N9,10		pre-1926	yes	no
Merling		S14,15		pre-1926	unknown	no
Miller Ditch		Carson Lake Past.		pre-1926	yes	no
Mills		V5; A1	>1 mile	pre-1926	yes	**yes**
Morgan		N2		pre-1926	yes	no
Mussi		end of T-Line	>1 mile	pre-1926	yes	**yes**
Mussi 1		end of T-Line		pre-1926	yes	no
Mussi 2		end of T-Line		pre-1926	yes	no
New River	BR, ext BR1	L2,6,7,9,11; S6; V7,9,11	>1 mile	pre-1926	yes	**yes**
New River 1		L6; S3,4	>1 mile	pre-1926	yes	**yes**
New Swope		S18	>1 mile	pre-1926	yes	**yes**
Norcutt		G4	>1 mile	pre-1926	yes	**yes**

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
Norton		S19		pre-1926	yes	no
Nygren		R2,3		pre-1926	yes	no
Oar		N2,5		pre-1926	yes	no
Paiute (vs. Upper Paiute)	Br.1, 3, Ext., Deep	S20,21,22,24,25	>1 mile	pre-1926	yes	**yes**
Patrick		S17,22	>1 mile	pre-1926	yes	**yes**
Petree		N1		pre-1926	yes	no
Phillips		T12	>1 mile	pre-1926	yes	**yes**
Pierson		L12		pre-1926	unknown	no
Pierson Ditch		A19		pre-1926	yes	no
Pirtle	Br.1	N6		pre-1926	yes	no
Piute (see Paiute)	—	—		pre-1926	unknown	no
Ponte		end of T-Line	>1 mile	pre-1926	yes	**yes**
Ranch		S6		pre-1926	yes	no
Renfro		A12; Upper G-Line		pre-1926	yes	no
Rice Ditch		Carson Lake Pasture		pre-1926	yes	no
S		S7,10		pre-1926	yes	no
S1		R4,6; S6,17	>1 mile	pre-1926	yes	**yes**
S11		R4,6	>1 mile	pre-1926	yes	**yes**
S1A		S6		pre-1926	yes	no
S1B		S6	>1 mile	pre-1926	yes	**yes**
S1N		S6		pre-1926	yes	no
S101		S6		pre-1926	yes	no
S2	Ext.	S17	>1 mile	pre-1926	yes	**yes**
S2 Wasteway	Br.1, Ext.	S22		pre-1926	yes	no
S2 Spill (Harmon Spill)	—	—		pre-1926	yes	no
S2C		S17,18	>1 mile	pre-1926	yes	**yes**
S2G		S6		pre-1926	yes	no
S5A		R2,9	>1 mile	pre-1926	yes	**yes**
S6	Br.1	R5		pre-1926	yes	no
S7B		R6,7		pre-1926	yes	no
Scrimsherwood		N3,4		pre-1926	unknown	no
SD		S3	>1 mile	pre-1926	yes	**yes**
Shaffner		D2	>1 mile	pre-1926	yes	**yes**
Sheckler	deep	A3; V1,4	>1 mile	pre-1926	yes	**yes**
Sheckler 1		A1; V4,5	>1 mile	pre-1926	yes	**yes**
Sheckler 2	Ext.	V4, A1		pre-1926	yes	no
Show		S20		pre-1926	yes	no
Shuey		T12, end of N-Line		pre-1926	yes	no
Sitton	Ext.	A12; Upper G-Line	>1 mile	pre-1926	yes	**yes**
South Fork	Br.1	A8	>1 mile	pre-1926	yes	**yes**

Drain	Sub-Drain	Canal Affiliations	Length	Date	Integrity	NRHP Contributing Element
South Upper Soda Lake		T12		pre-1926	yes	no
Stergeon		T6,7	>1 mile	pre-1926	yes	**yes**
Steve		R6,7		pre-1926	yes	no
Stillwater Point Reservoir		S19	>1 mile	pre-1926	yes	**yes**
Stillwater Slough	Br.1	end of S-Line	>1 mile	pre-1926	yes	**yes**
Stillwater Slough Cutoff	Br.1	end of S-Line		pre-1926	yes	no
Thoma		L1	>1 mile	pre-1926	yes	**yes**
Thompson		S14		pre-1926	yes	no
Towle		V8		pre-1926	yes	no
UD		T11		pre-1926	yes	no
U1D	Br.1	T7,9,11	>1 mile	pre-1926	yes	**yes**
UM		T15,17	>1 mile	pre-1926	unknown	**yes**
Upper Diagonal	deep	L1	>1 mile	pre-1926	yes	**yes**
Upper Diagonal 1	Br.2	L1		pre-1926	yes	no
Upper Diagonal 2		A11; L1	>1 mile	pre-1926	yes	**yes**
Upper Mussi		end of T-Line		pre-1926	yes	no
Upper Paiute (vs. Paiute)	Br.1, Deep	R2,3,5,9; S7,17	>1 mile	pre-1926	yes	**yes**
Upper Paiute 1	Br.4	R9		pre-1926	yes	no
Upper Paiute 2		R9; S17		pre-1926	yes	no
Upper Soda Lake	deep	N11,12; T11,13	>1 mile	pre-1926	unknown	**yes**
Upper Soda Lake1		T8,10	>1 mile	pre-1926	unknown	**yes**
Upper West Side	deep	A2,4; V1	>1 mile	pre-1926	yes	**yes**
Upper WestSide 2	Br.2	A4,5		pre-1926	yes	no
Vencil		D1,3	>1 mile	pre-1926	unknown	**yes**
Viera		S22		pre-1926	yes	no
Wade		end of T13	>1 mile	pre-1926	yes	**yes**
Weishaupt	Br.1	S22		pre-1926	yes	no
W. Carson Lake		G3,4,5		pre-1926	yes	no
West Lee		A15,18		pre-1926	yes	no
Worden		R1		pre-1926	yes	no
Workman		T5,6		pre-1926	yes	no
Yarbrough		A18	>1 mile	pre-1926	yes	**yes**
Yarbrough 1		A18		pre-1926	yes	no
York Ditch		Carson Lake Pasture		pre-1926	yes	no